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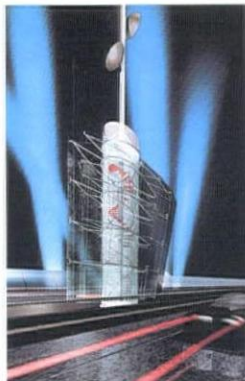
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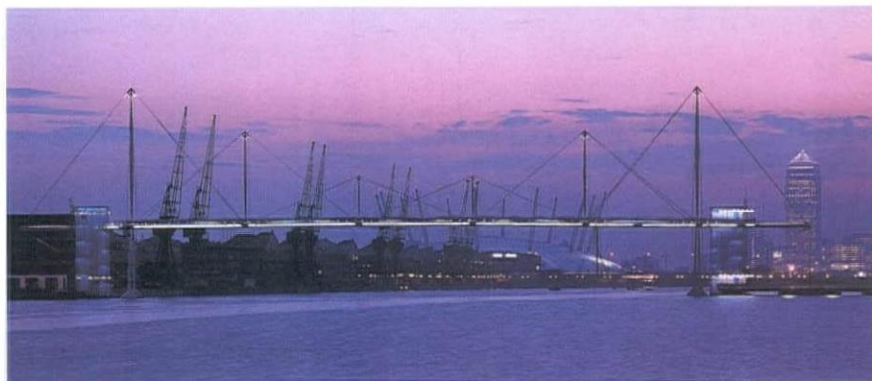
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CONSTRUCT



Motorway centre, Nanterre
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Footbridge, Docklands, London by Lifschutz Davidson (p72)

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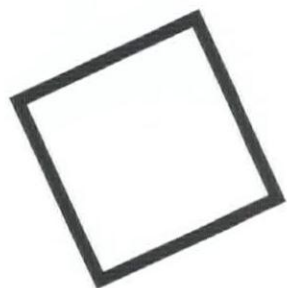
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ar+d

Emerging Architecture

The Architectural Review and **d line™** *international as* (the distinguished Danish architectural ironmongery firm) are launching an annual international award to celebrate the talent of a generation of architects as yet largely unrecognized. We are looking to celebrate excellence in executed work ranging from buildings and interiors, to temporary structures, exhibition and product design. The ar+d award will have total prize-money of £10 000 annually, and winning schemes will be specially published in the AR.

ar+d award

eligibility

It will be open to all architects and designers whose qualifications are recognized by their national accreditation organization, provided that they are 45 or younger. The age has been chosen on the basis that many cannot develop an original vision before that time, either because of the long education and training period, or because of lack of opportunity. With the latter in mind, entries will be accepted from people working for others, provided that a principal in the employing office provides written evidence guaranteeing that the work is that of the entrant(s). Groups or partnerships will be eligible to enter, provided that all members are of the right age, and that they are all named in the submission.

prizes and publication

Prizes will be given in several categories. So that the range of entries can remain as wide as possible, the categories will not be determined beforehand, but decided on by the jury. Besides buildings, entries on interiors and on manufactured products (for instance furniture or light fittings) are encouraged.

There will be an overall prize of £5000; its recipient will be chosen from the winners of the individual categories. All winning schemes will be published in the AR, and so will others chosen by the jury. The overall winner will receive a trophy by Knud Holscher, who has long been the principal designer for d line.

Entrants may make more than one submission if they wish.

jury

The jury will be:

Billie Tsien, of Williams & Tsien, New York

David Chipperfield, of David Chipperfield Architects, London

Massimiliano Fuksas, of Massimiliano Fuksas Architetto, Paris, Vienna and Rome

Theo Bjerg, Professor at the Danish Royal Academy

Peter Davey, Editor of the AR

entries

Entries should be mounted on not more than two A2 sized boards, which should carry drawings, a brief written description (in English) and some photographs (in either colour or black and white). The material must be capable of reproduction by the normal four colour printing process. The AR reserves the right to ask winners for further material for publication purposes, once the jury has made its decisions.

Entries should be properly packaged and clearly marked 'ar+d' on the outside. They should be sent to THE ARCHITECTURAL REVIEW, 151 ROSEBERY AVENUE, LONDON EC1R 4GB, UNITED KINGDOM.

To ensure anonymity, all entries must be accompanied by a sealed envelope which should contain the names of the entrants. On receipt by the organizers, both envelope and boards will be given an identical individual number. After the jury's decisions, the envelopes of the winning schemes will be opened and the names read.

timetable

Entries should be received by The Architectural Review by 6 September this year. Evidence that an entry has been despatched by that date will be accepted. The jury will meet shortly afterwards and make its decisions. Prizewinners will quickly be informed. Results will be specially published in the November 1999 AR.

A prize-giving ceremony will be held in London in October.

Other conditions

Entry will acknowledge that The Architectural Review has the right to reproduce the entry in whole or part without payment of copyright (where we are made aware of their names, photographers will be acknowledged).

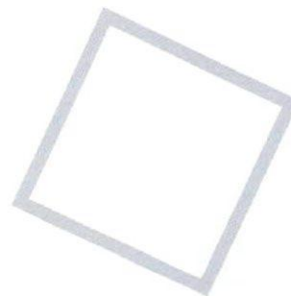
The organizers reserve the right to change membership of the jury.

The jury reserves the right to vary the apportionment of prize money.

The organizers cannot be responsible for negligence or damage to entries by carriers.

Entries will not normally be returned. If an entrant would like to have the material back, it should be either collected personally, or accompanied by the appropriate amount of international postal reply coupons.

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Architects: Thomas van den Valentyn and S. Mohammad Oreyzi, Köln; Lighting design: Licht Kunst Licht, Bonn/Berlin.

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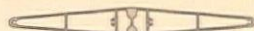
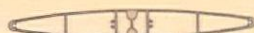
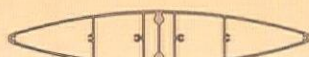
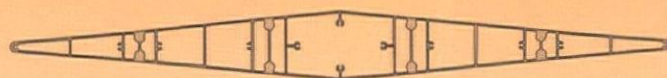


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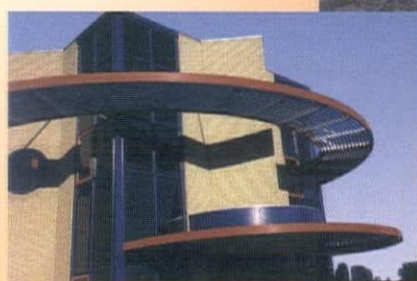
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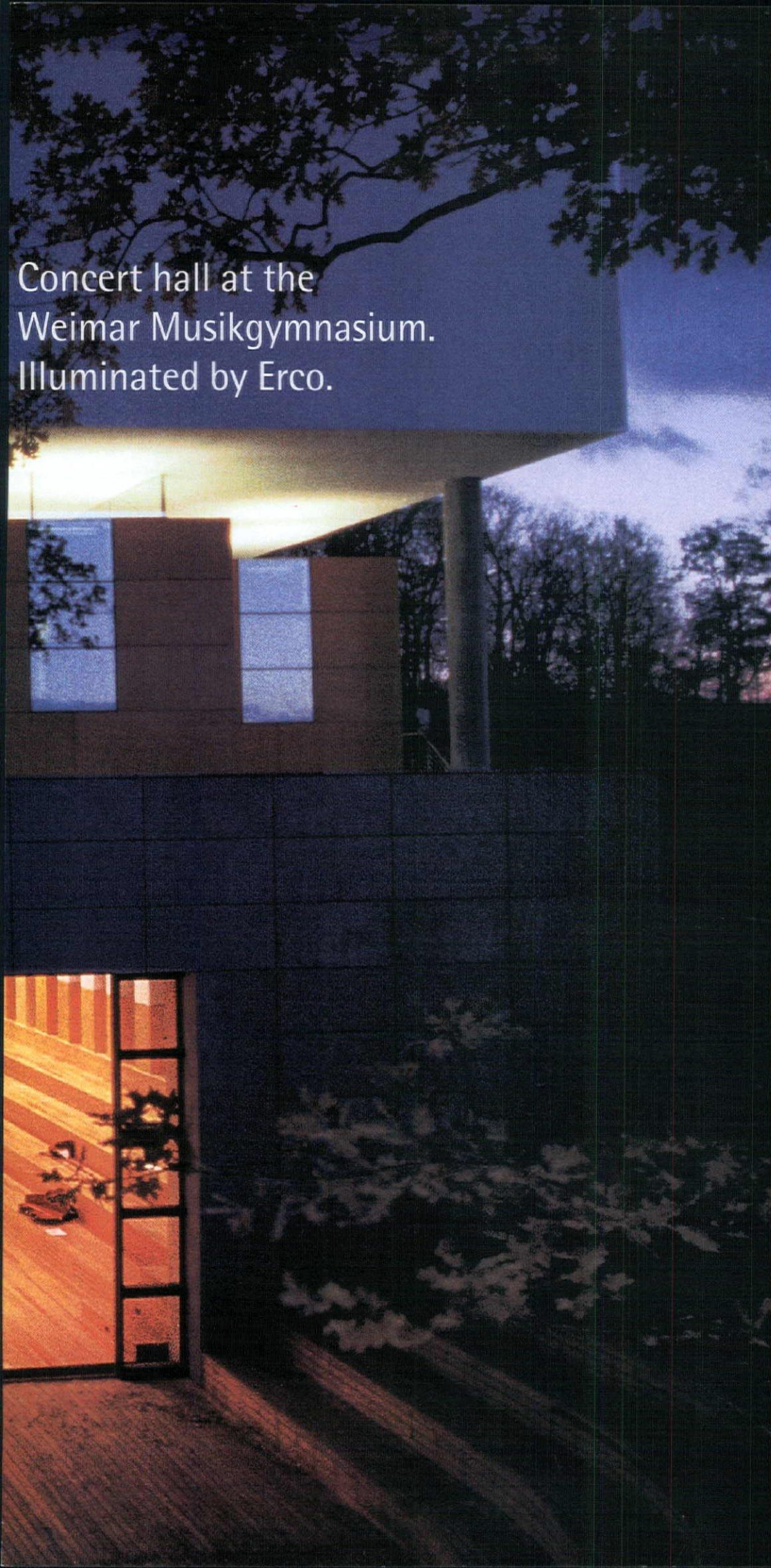
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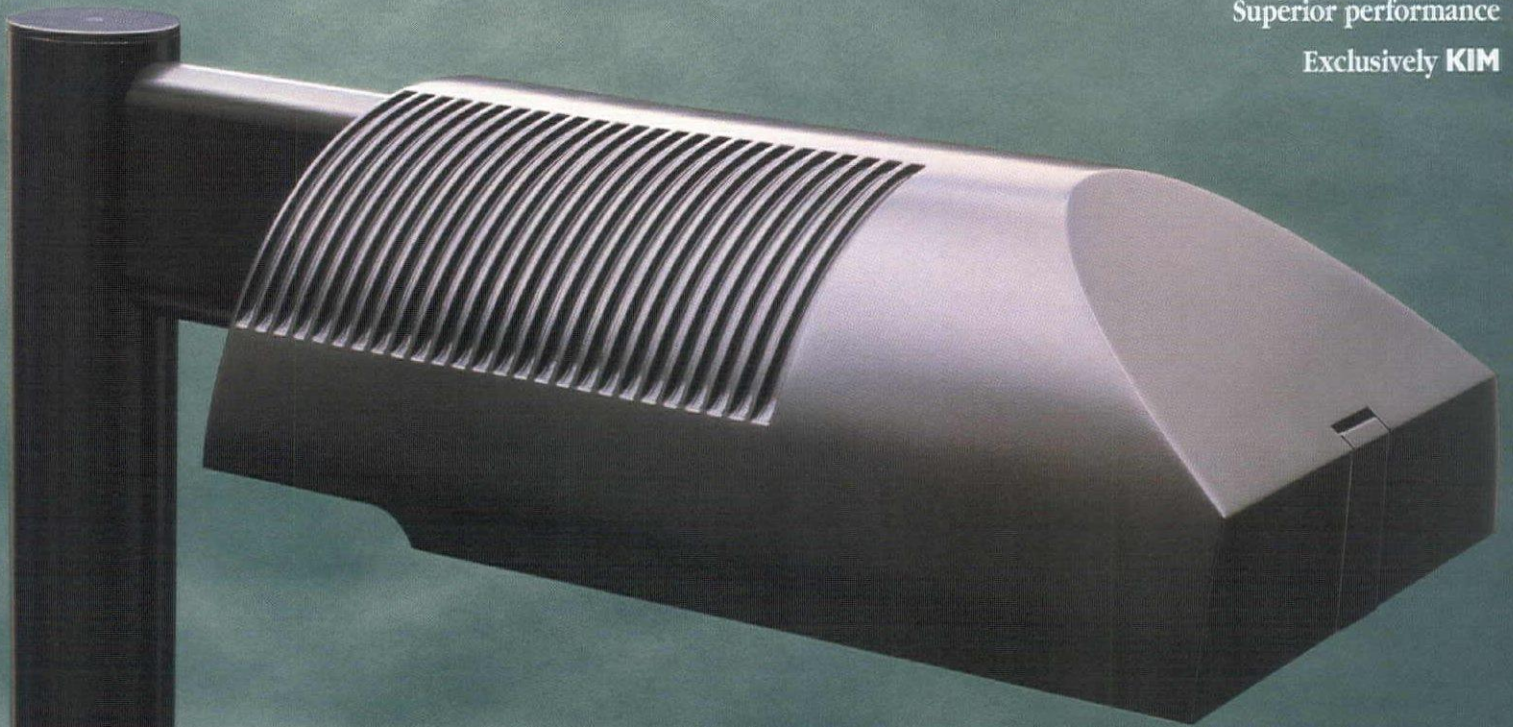
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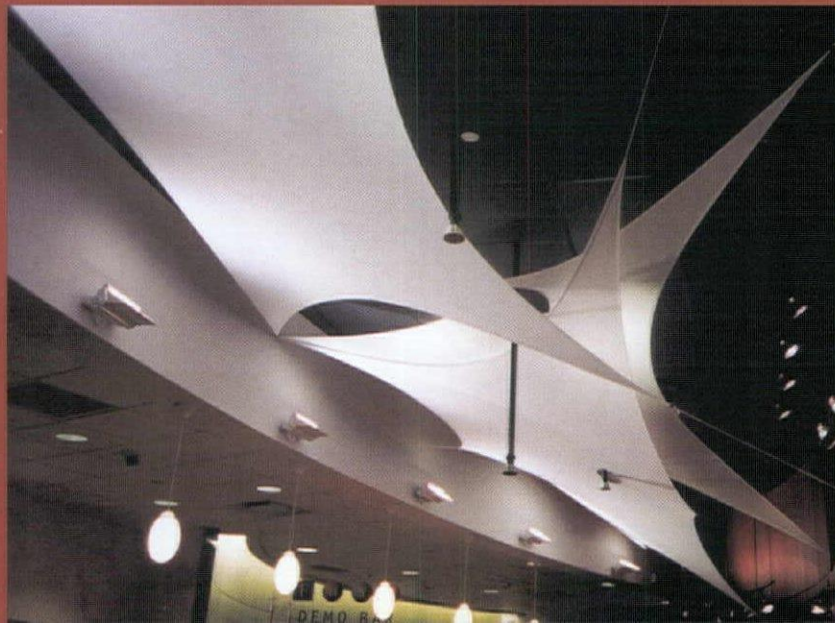
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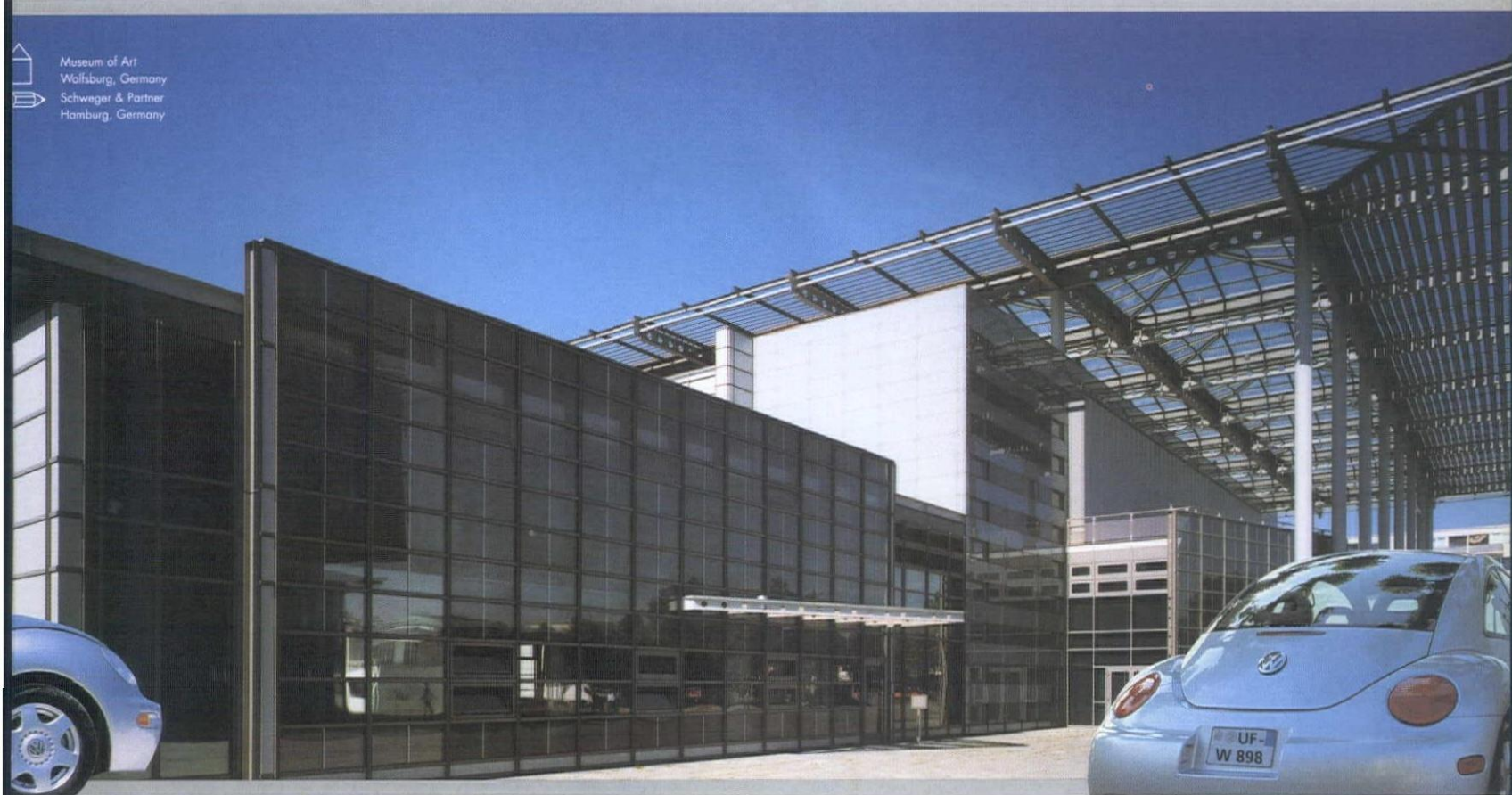
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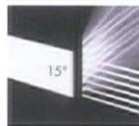
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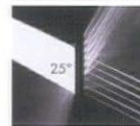
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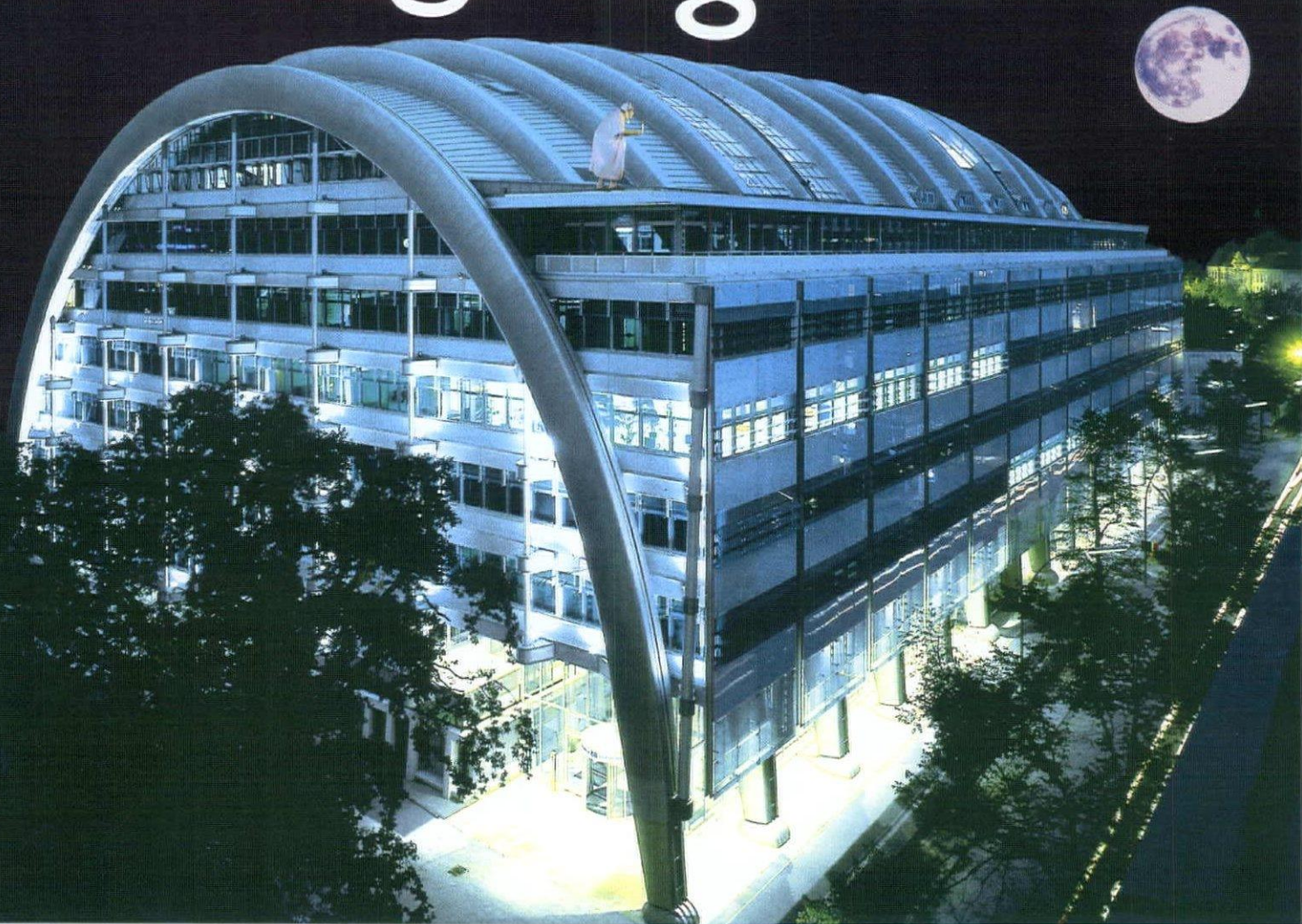


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The economy needs a few highlights



Berlin Chamber of Commerce and Industry "Ludwig-Erhard-Haus" · Architect: Nicholas Grimshaw & Partners, London/Berlin

Nicholas Grimshaw

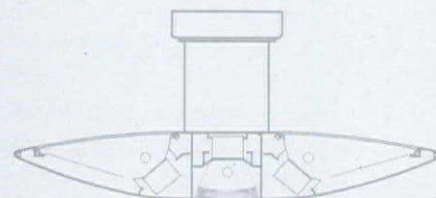
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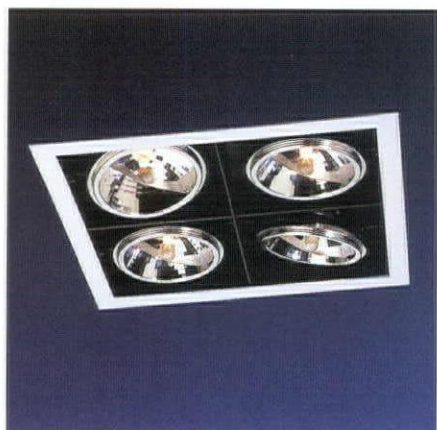
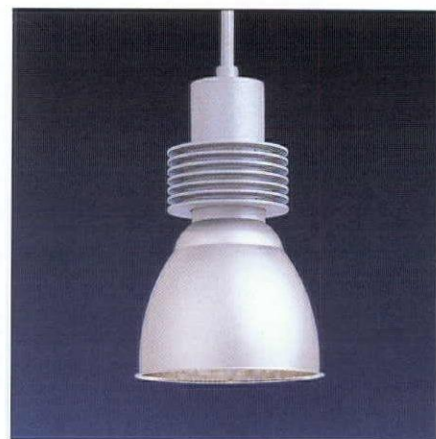
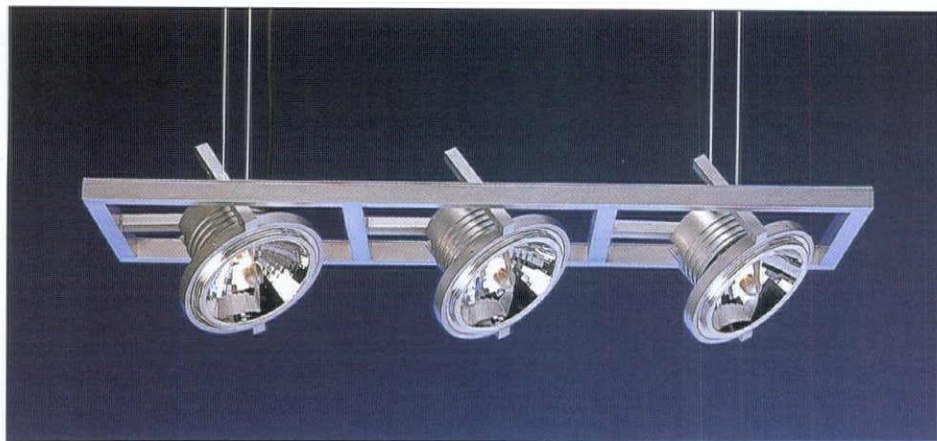
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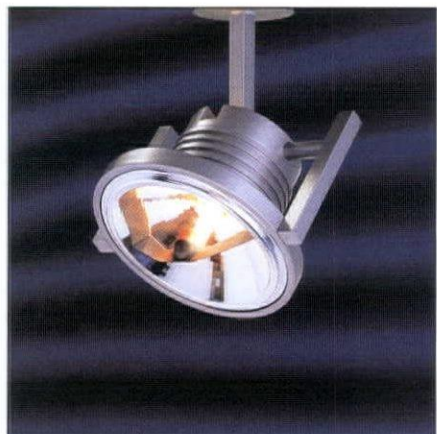
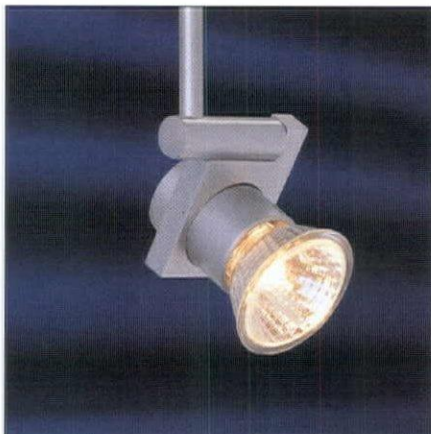
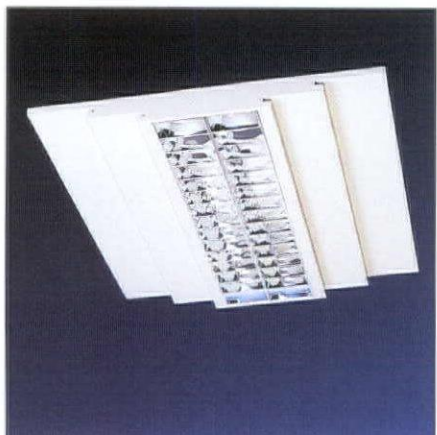
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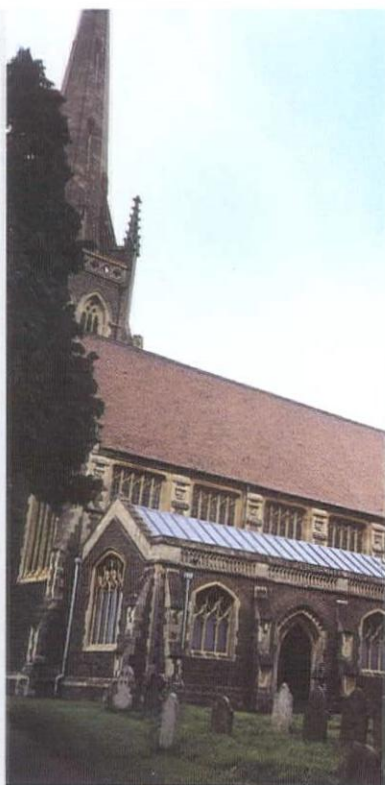


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(Above) St Pauls Church, Wokingham.
(Above right) St Albans school, Ipswich

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VIEW

New, improved AR website

The Architectural Review has revitalized its website which can now be visited at www.arplus.com.

It contains information about recent issues: contents, articles and book reviews (there is an inbuilt link to the Amazon site, so that you can order books mentioned over the Net). Specimen pages and spreads can be looked at and there are details on how to subscribe. Contents of the forthcoming issue will be revealed.

Full information on our new £10 000 ar+d award for younger architects is given, including suggestions on what to enter and an explanation of how to. The AR's May Dubai conference on Modernity and Tradition in Middle Eastern Architecture is featured in detail.

We hope to develop the site into a much more informative and interactive mechanism in the next few weeks. It will contain more up-to-date information on competitions, exhibitions, awards and new buildings than we can get into the magazine itself. And we shall have a noticeboard on which readers can post their comments and their own news of conferences, meetings and so on. A cumulative index to the last 12 years of the AR will shortly be available.

Dutch sustenance

Sustain '99, in Amsterdam from 25 to 27 May, is intended to be the world's largest sustainable energy exhibition.

Held at the RAI, it will aim to show latest developments in wind, geothermal, wave and

solar energy, hydro power, biomass and biogas. There will be national pavilions from Finland, the Netherlands, the US and the UK.

An 'ideal sustainable home' will be built. It will be a low energy house with energy efficient systems (for instance heat pumps and combined heat and power), and will aim to balance energy loss with gains from devices that tap ambient sources like photovoltaics, passive glazing and a solar boiler. Fittings will be of sustainable wood and other renewable materials.

A bio-mass park will give examples of the use of biomass in energy production, with sources as varied as sawdust, hemp and rubbish. New technologies explored will include gasification, pyrolysis and combined heat and power generation. More details of the exhibition and the conference that accompanies it can be obtained from the Amsterdam RAI on internet site www.emml.com, or telephone +31 205 491 212, or fax +31 206 464 469.

Jubilation in London's East End

The extension of London's Jubilee Line (p54) has made possible redevelopment of a great swath of run-down land in the east of London. MBM of Barcelona has won a design competition for the Arc of Opportunity which runs from Stratford station in the north (p56) to the north bank of the Thames opposite North Greenwich station (p68) and the Millennium Dome.

This turgid grey area has of course individual places of great quality, but for many years has desperately lacked investment and been difficult to reach. The new transport link (which ties together many existing but unintegrated routes) is expected to bring new life to the area by making it more accessible, so increasing land values and encouraging development. Eventually, an international station will be built at Stratford as part of the proposed high-speed Channel Tunnel link.

Rickie Burdett, a jury member, said that MBM's submission showed 'design clarity and urban simplicity. New neighbourhoods with streets and public spaces will be formed round dramatic water features. The proposals integrate existing and new communities, providing living and working opportunities for the area'.

MBM has an outstanding track record in urban renewal, having been greatly involved with the regeneration of some of Barcelona's most run-down areas (AR April, p17). Other finalists were Arup Associates, Patel Taylor Architects and Pringle Richards Sharratt.

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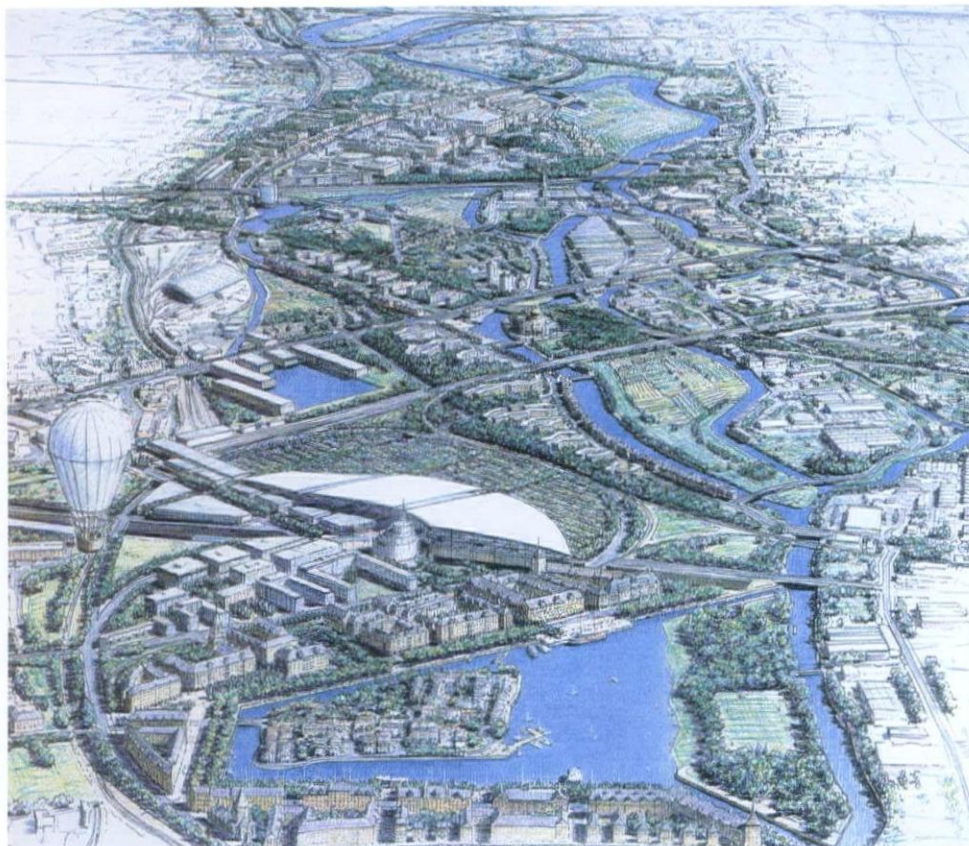
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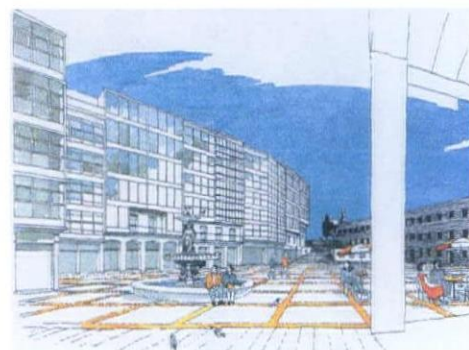


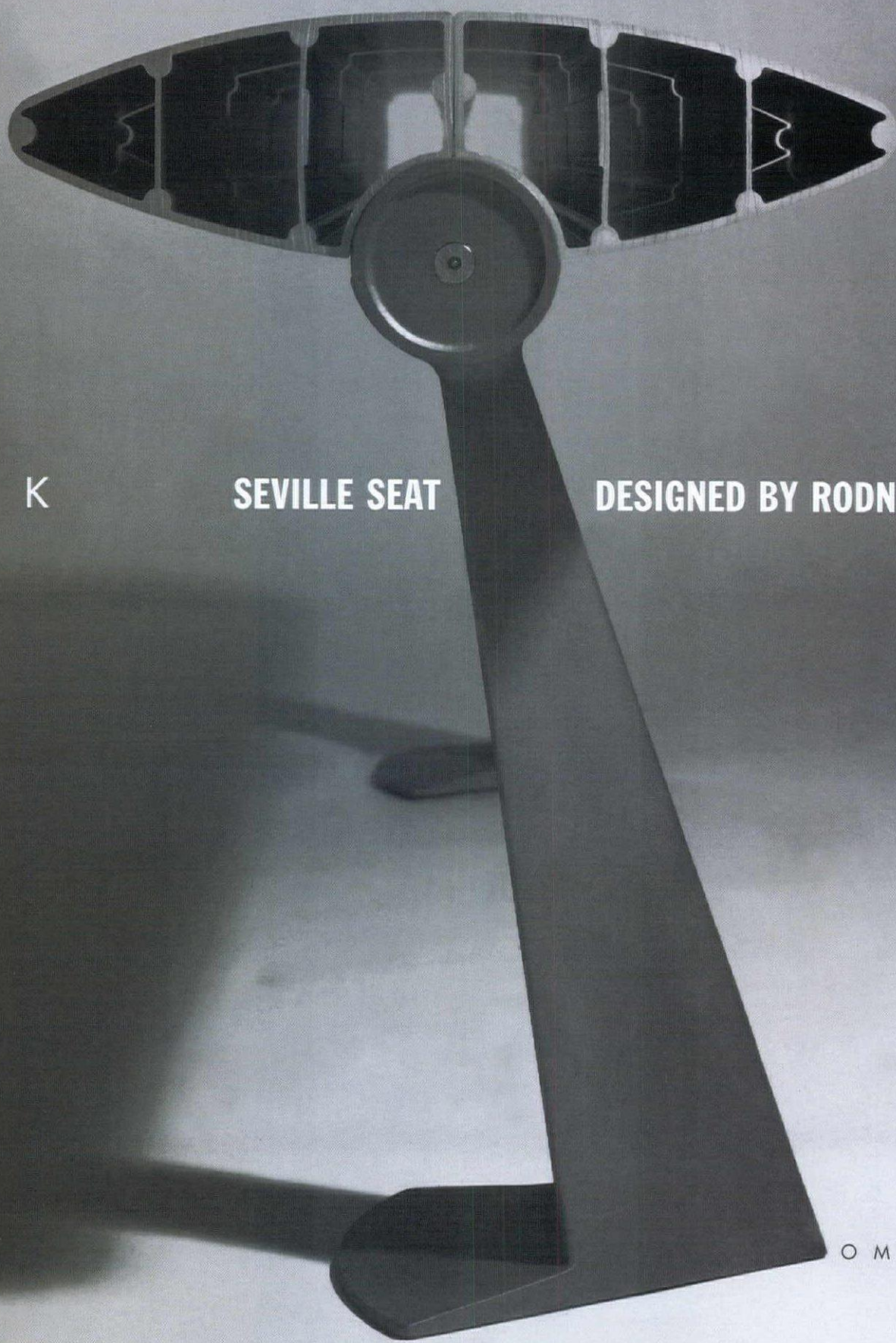
Bernard Tschumi Architects have won an international competition for the School of Architecture at Florida International University in Miami.

The building will be adjacent to one of the main campus entrances. Studios, classrooms and offices will surround a central open court animated by the colourful forms of lecture hall, library and reading room. Shade will be provided by covered walkways and a covered terrace, offering formal and informal areas for student gathering. Bruno-Elias & Associates of Miami are associate architects. Completion expected in 2001.



MBM's competition-winning scheme for the derelict tracts now connected to central London by the extension to the Jubilee line (see opposite and p54) is intended to revitalize the Lea valley by restoring flood plains and meanders, and by adding lakes and canals. Along this watery armature, a fabric is to be built that will bring new functions and urbanity to what has been claimed to be the largest post-industrial site in Europe (not a title for which there is eager competition). There will be 18 000 dwellings arranged in hamlet clusters surrounding urban parks. The expenditure of vast amounts of public and private money could restore the valley to something of the idyllic character celebrated by Isaak Walton in the seventeenth-century *Compleat Angler*.





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VIEW

Mediating architecture

The fourth Graz Biennial on media and architecture is to be held in the southern Austrian city between 24 and 28 November this year.

It aims to find new developments in visual media which deal innovatively with architectural spaces and urban issues. As well as exhibiting examples, there will be a congress to examine interactions between art, culture, technology and economy in which architects, artists, critics, producers and media experts will take part. Installations will be scattered through the delightful Baroque capital of Styria as 'settings for delocated screenings' and 'spread installations'. Languages are German and English.

An international competition is to be held, with entries in two categories. First: Art and Essay – creative perspectives on cultural, social, political and aesthetic spaces; second: Architectural Documentation – documentary reflections on architecture and urban space. Entries of installations and performances should be presented by 31 May, those in video, film, CD-Rom and the Internet by 30 June. Six awards will be given from a total of ATS300 000 (£14 550). For further details and entry forms, fax +43 316 356155, e-mail art.image@thing.at or Internet <http://www.thing.at/art.image>

Pritzker for Foster

Norman Foster is the winner of this year's Pritzker Prize for Architecture.

Chairman of the jury, J. Carter Brown commented that Foster is 'rooted in the grand tradition of twentieth-century Modernism' and that at 'whatever scale, from a glass elevator to an airport, his vision forges the materials of our age into a crystalline, lyrical purity that is highly personal, brilliantly functional and – shy as we are about using the word – just downright beautiful'.

Bill Lacey, executive director of the Prize, was equally ecstatic: 'His design objectives are guided not only toward the overall beauty and function of a project, but for the well-being of ... the end-users. This social dimension to his work translates as making every effort to transform and improve the quality of life. In the early '70s, he pioneered the notion that the workplace could be a pleasant environment'. Foster's buildings 'set a standard of design excellence in the use of modern technology pushed to its artistic limits'.

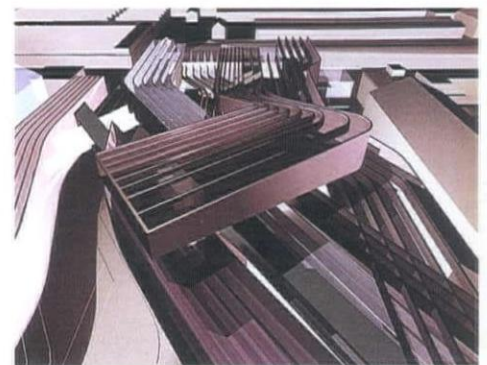
Other members of the jury were Giovanni Agnelli, chairman of Fiat; Ada Louise Huxtable and Toshio Nakamura, architectural critics; Jorge Silvetti, chairman of the Graduate School of Design, Harvard; and Lord Rothschild, chairman of Britain's National Heritage Memorial Fund. The award cere-

mony will be in the newly restored Altes Museum in Berlin by Schinkel and in Mies's New National Gallery in the same city.

After a shaky start, when the first Pritzker went to Philip Johnson 20 years ago, the award has recently gone to distinguished international architects; the last four winners were Ando, Moneo, Fehn and Piano. Foster was knighted by the Queen in 1990, and in 1997 was appointed to the Order of Merit, Britain's highest honour for artists and intellectuals.

Rome's Guggenheim by Hadid

Zaha Hadid has won a major international design competition for a new Centre of Contemporary Arts in Rome, described as 'Rome's Guggenheim'.



Hadid's Rome Guggenheim

AR Middle East conference

The Architectural Review is organizing a second international conference in the Middle East: on Modernity and Tradition in Architecture, and it is to be held at Jumeirah Beach Hotel in Dubai on 24, 25 and 26 May. It follows our successful conference held in Abu Dhabi in March 1998.

This year's conference will be addressed by architects, planners and other experts from all over the Middle East and from outside the region, and the theme of the occasion will be examined from many different points of view. It is to be held under the patronage of HH Sheikh Hamdan bin Rashid al Maktoum, Deputy Ruler of Dubai, Minister of Finance and Industry, and Chairman of the Municipality, and we are happy to be in association with the Society of Engineers of the United Arab Emirates.

Speakers will include Sir Michael Hopkins whose work, for instance at Bracken House and

the Houses of Parliament in London, sensitively relates new buildings to historical contexts with new environmental perceptions.

Ali Shuaibi of the Beech Group has designed the most important interventions in Riyadh and gained an Aga Khan Award for them.

Rashad Bukhash is Head of Historic Buildings in the Municipality of Dubai.

Nader Ardalan is responsible for the new Al Sharq Souq development on Kuwait seafront.

Martin Giesen is Dean of Architecture at Sharjah University and has written extensively on the area.

Can Çinici, with his father Behruz, designed the Aga Khan Award-winning Parliamentary Mosque in Ankara, Turkey.

Professor Max Fordham is one of the most inventive and environmentally aware services consultants in the world.

Bodo Rasch of Rasch Associates designed the umbrella shades at the Prophet's Holy Mosque in Medina.

Shadia Touqan is Technical Office Director for

the revitalization of Bethlehem and the Old City of Jerusalem, Palestine.

Imad Ghantous is Director of Middle East Operations for SOM.

Hakam Jarrar is Technical Director, KEO International Consultants (formerly HLW).

David Blackwood Murray is senior partner for landscape architect Derek Lovejoy & Partners, who have worked extensively in the region.

Yahya Fiuzy built the Tehran International Conference Centre.

In addition to the formal proceedings there will be social occasions for meeting speakers and other delegates. Site visits to interesting buildings and projects in the area will be organized.

The conference is open to practitioners and others from the region and elsewhere. Further information can be obtained by contacting AR Publisher Neil Williams in London (e-mail: neilw@construct.emap.co.uk; fax: +44 171 505 6750), or Judi Gray of Gray Business Communications, Dubai (tel: +971 4 496663; fax: +971 4 499551, e-mail: graybiz@emirates.net.ae).

The site lies near the Foro Italico, and Hadid's proposal involves the phased demolition of existing military barracks to be replaced by individual museums for art and architecture and facilities for multimedia cultural events. The cluster of low level, sinuous forms was commended for its rigour, inventiveness and use of direct light. Steven Holl was placed second and Rem Koolhaas third. With the recent opening of the LF One pavilion in Weil am Rhein (AR April) and the current development of a new art centre in Cincinnati, Hadid is finally getting the chance to build on a large world-wide scale.

Erratum

Photographs of the restaurant in Gothenburg (AR April, p80) were taken by Hans Wretling, except 4 by Åke E. Son Lindman.

Letters

Contrast, not compare

SIR: Your comparison of the Jewish Museum in Berlin, and the Scottish one in Edinburgh was perhaps well meant, but it is vulgarly inappropriate to suggest the stories the buildings tell can be compared in any way.

On the one hand, the Scottish museum can give an account of the gradual increase in prosperity of a nation, and according to your account, it does so with systematic efficiency explaining a programme invented by the curators and architects in a progression of spaces from the darkness of prehistory in the basement to a glittering consumerist attic representing our day.

On the other hand, the Jewish Museum's story cannot possibly be represented without reference to the years '33-'45, to the unbelievable horrors of the Holocaust, and also to the ways in which Jews had a vital, integral part in the society of Berlin, and, wider, the whole of Germany before the Nazi's came to power. No sequence eloquent of progression was possible here: no escape from the facts of destruction, inhumanity and horror. Hence the immensely powerful voids, and hence the slashes in the silver skin. And even perhaps the choice of zinc, a material which will be a metaphor of the glittering life of the '20s, changing gradually (quite quickly even) to the drab grey of the camps.

Only a profoundly original mind could have tried to cope with all these problems and tried to turn them into concrete reality. Only a radi-

cal design could even hint at the psychic dimensions of the most dreadful tragedy of the twentieth century. So it is quite ridiculous to criticize the building because it will be difficult for the curators to make exhibitions. Without doubt, it should be. Curators, like good architects of Libeskind's kind, should be prepared to take risks and use their imagination. If Germany cannot produce people of sufficient imagination, the nation should look elsewhere, as it had to when trying to find an architect capable of addressing the matter in the first place.

Yours etc

ERIC AMSTROM

Amsterdam, the Netherlands

Berlin reservations

SIR: Your guarded remarks about the Jewish Museum in Berlin (AR May 1999, p39) are maybe the first to question some of the aspects of the remarkable building which are extremely troubling to a Modernist. So far as I have seen, all discussion of the building, both here and abroad, has been conducted in terms of unreserved adulation. May I add to, and perhaps help clarify, some of the problems to which you allude?

First, there is clearly a rejection of conventional curatorship – the building is obviously an extremely difficult one in which to exhibit. Could this be the reason why it seems to have taken so long to mount the exhibitions? (We do not get all the Berlin insider gossip here.) As PM remarks about the Nussbaum museum, it 'is a disconcerting place in which to contemplate paintings' and there is no reason to expect that it will be any easier to contemplate the objects in the Berlin museum. Perhaps it should not be: perhaps it should be a trying experience to perceive artefacts, so many of which relate to suffering. Or perhaps their essence could more easily be understood in a calmer atmosphere.

Second, this indifference to convention shows an attitude on the part of the architect that has been suppressed or submerged for much of this last half century. The museum is clearly the product of an individual perception, which has become more important than consensus. It is, or would be, an avant-garde building, intended to raise the consciousness (and the conscience) of society. By ignoring some conventions (though, as you point out, being very conventional in some other ways) an individual message of great intensity has been projected, but can it be appreciated by the mass of people to whom it is directed? If it

cannot, can it be more to most people than a very eccentric building?

Third (and related to the second point), is the architect, by trying to compress into the building ideas and messages normally dealt with in literature, pushing architecture too far? It is easy to see how the stories of the links between the Jews of Berlin which pattern the walls could have been told in a novel by Joyce, Eco or the South American magic realists. But can they be articulated in architecture?

Fourth (and you do not touch on this in your article), there must be questions about the radical construction of the building. The deep sills must surely attract a lot of dirt in a filthy city like Berlin, and I observed on my visit that on the most horizontal ones are stretched little wires almost like tiny models of wires used to such dreadful effect in the camps. They are presumably not metaphors but bird preventers: they did not seem to be totally effective. And then there is the concept of putting the glass in so far back in such an unconventional way – in constructional terms, daring to say the least.

None of this should detract from what is obviously a brave attempt at creating a profound and moving building.

Yours etc

I. J. SCHMIDT

Hamburg, Germany

Auld Streekie?

SIR: Just a line to sound a note of caution about your optimistic footnote on the weathering properties of the Museum of Scotland (May p39). Edinburgh may no longer be 'Auld Reekie', but like any highly trafficked city, it is far from clean and pollution free. I have doubts about some of the slits in the facades and the apparent lack of eills and drips. Will the building look as if it is weeping in a few years' time. Fowke may have been pompous, but he knew how to throw water off his elevations.

Yours etc

MURRAY GRANDBY

Glasgow, Scotland

Pseuds corner?

SIR: I've given up trying to find a way of not sounding like a tedious conservative complaining about 'stuff and nonsense' in modern architectural debate. All I can really do is assure you at the outset that I despise nostalgia in all its forms, and agree with almost every one of your 'Outrage' judgements. However, I was



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RAISING THE STANDARDS

VIEW

reading your March issue, and it simply got to the stage when I thought, 'Hold on. The pompous style of this writing is ruining any impression of gleaning any "truth" about the buildings being discussed.'

You have a good magazine, but by ditching hyperbole and obscurantism, it could be a lot better. This language, which doesn't even sound like it convinces those who write it, I believe is a symptom of a certain cowardice, as I will discuss later.

For example, regarding the Villa VPRO (p38ff), it has both 'Euclidean geometry' and 'Euclidean volume'. The building is organized externally into a series of interlocking rectangular visual units, like my 1963 secondary school (not Euclidean) and a sort of 'hair-grip'-shaped gap, also not Euclidean. What's a Euclidean volume, anyway? Seeking to rescue a basically naff entrance organized round a car park and decorated by motorway crash barriers, Piet Stam refers to some inspired link to traditional Dutch architecture, and in doing so creates a critique which smacks of phoneyism and falsehood. Moving on, what's the interior concrete hump inside for? Do you walk up it? If so, when and why? Do you take your wheelchair-using colleagues? The photography shows the interior to be gloomy, the sort of place which must always remain ready for a photoshoot.

The sort of appraisal which Connie van Cleef makes later about Koolhaas' Educatorium, that it is 'like a labyrinthine and slightly inhospitable structure, more attuned to the eye and less accommodating of quotidian human needs ... The predominantly industrial materials also lack a certain warmth or tactility', is entirely missing. Would any of us want to work in a building like this, gloomy and shadowed, impersonal by design and managerial decree, created by architects so off-beam they want to get rid of exterior walls, and replace them with – wow! – hot air!? Could any of us go to work in this building every day for 6½ years and 'make up a different story for ourselves every day ... as our own plot demands'?

Another writer, Connie van Cleef, finds Delft University's library 'seductive', without saying why. Although the second paragraph (p45) seems to me exemplary of how words can add to architecture and not obscure it, she also says this High-Tech 'Book Bunker', with steel, cone and glass has an 'Arcadian vista'. What is that? Does she really mean this building is 'ideally rustic'? Or the 1960s Brutalist

campus around it? The cone houses four 'hermetic reading rooms'; it seems almost impossible that they could be that hermetic, as they are linked by a central light (and noise!) shaft. Although this cone could have been filled with windows, it is not, and the students have to live with concrete views and neon lights. I expect every one of your readers has recollections of libraries like this, and that none of the recollections is positive. Windows for looking out of and letting light in are invaluable for providing something to do in those work lulls, and for giving a light which helps us get over them. Think of the libraries you have liked. Full of natural light, views, books and calm, I'll bet. Lastly, another geometrical question: in an office of about 30 architects with a good few engineers to boot that I was visiting today, none of us had the faintest idea what 'Cartesian geometry' (Educatorium, p50) was, or how you defy it. Intellectual obscurantism is a game anyone can play, and it's only really fun to the person playing. I've checked, and he did write about geometry. What he wrote, no-one in my professional life is aware of.

The language twists and turns, and rarely reflects the truth of the buildings in question. It is difficult to weave these bitty objections into something greater, but I think that they operate together to imply a rejection of confident linguistic and architectural sobriety – and also good polemic, positive or negative – in favour of a series of overwrought justifications and pleas for an architecture beleaguered and unloved by public opinion. Brutally chopped up, so much of architectural writing is unconvincing verbiage, a series of linguistic niceties woven into an 'essay'.

Language should not be armour for architecture, but arms; it should help architecture bind itself to its public masters, and educate the master in how to deal with the servant, and it should do this even in – especially in – trade journals.

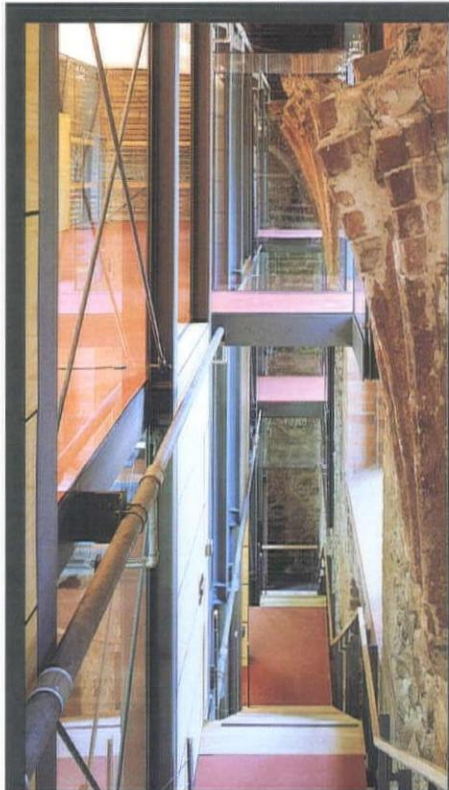
Thanks for reading this far – good work on the journal in general, though I miss some of the stuff you used to have more on, not linked to current projects – clips of history, theory and the like. It would be interesting to know your thoughts on this; do you like, or tolerate, the style of your contributors?

Yours etc

LEIF JERRAM

Munich, Germany

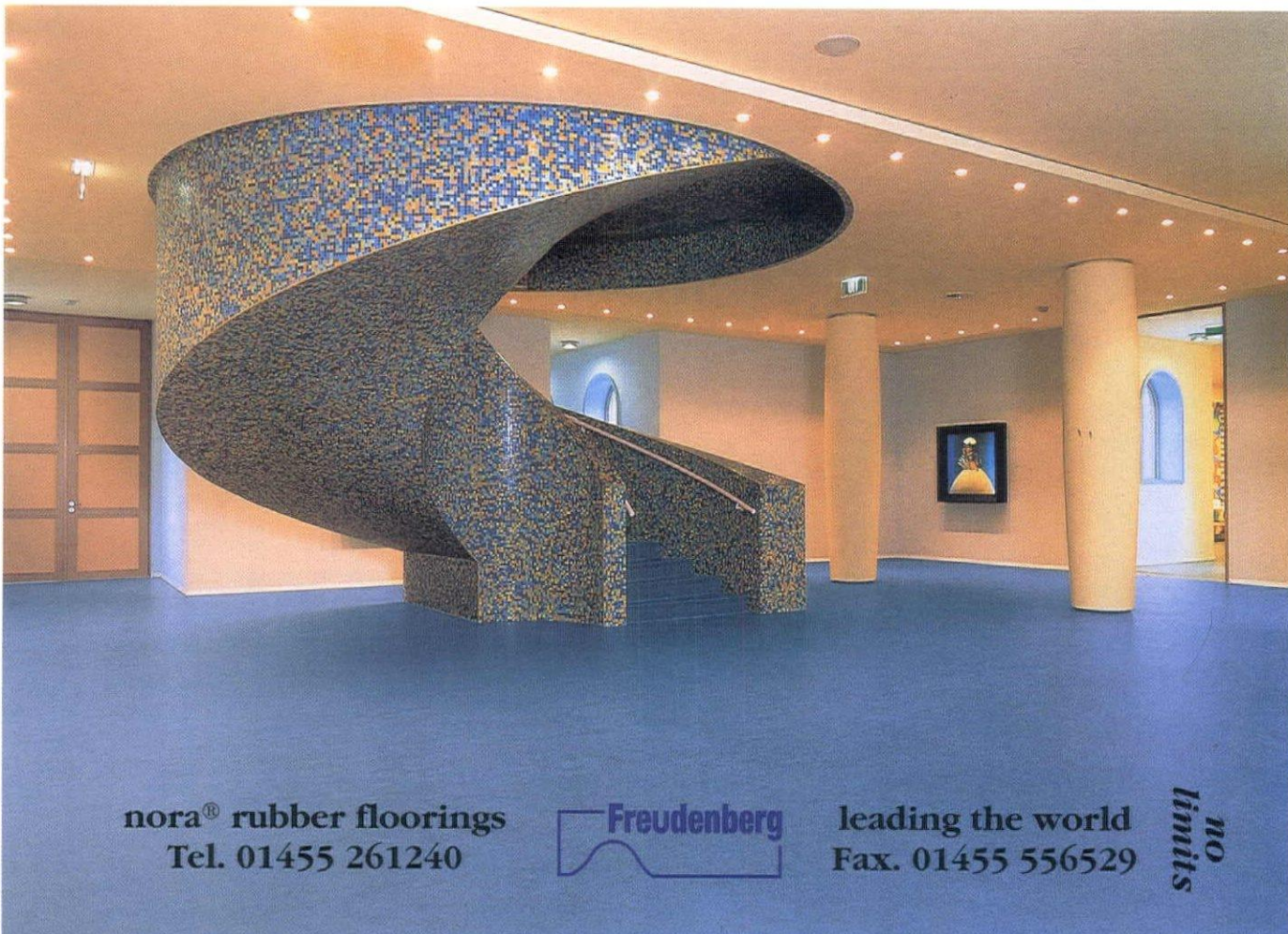
Writing about architecture is almost as difficult as designing buildings. Though we struggle continually, we don't always get it right. THE EDITOR



June

Creative revitalization of old buildings forms the theme of next month's issue. The refurbishment and re-use of old structures forms a vital and increasingly important aspect of architecture, with attendant economic, social and ecological benefits. We look at some of the best recent examples from around the world, including Volker Giencke's sensitive conversion of a monastery in the Austrian village of Seckau and Klaus Block's insertion of a library into a church in Münchenberg, Germany, which combines a sensuous materiality with spatial drama. In the Spanish town of Zamora, Manuel de las Casas creates a new building for a Hispano-Portuguese Institute within the fragile remains of a Gothic convent, and in northern Portugal, Alvaro Siza's family villa is a characteristically austere, yet sensitive addition to the rugged landscape. In Scottsdale Arizona, Will Bruder has inventively conjured a dynamic new contemporary arts museum for the town within the shell of an old cinema. And on a smaller scale, yet also in the heart of the city, Future Systems' refurbishment of a redundant industrial building to house a boutique in the New York district of Chelsea, displays characteristic ingenuity and sculptural panache.

Plus the usual stimulating mixture of Delight, Design Review and Interiors, featuring Mecanoo's new theatre in Amsterdam. Get this together with 11 other equally fascinating issues by completing the enclosed subscription form.



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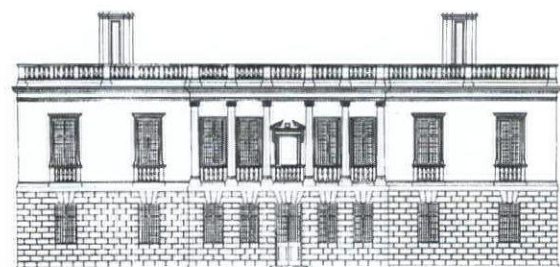
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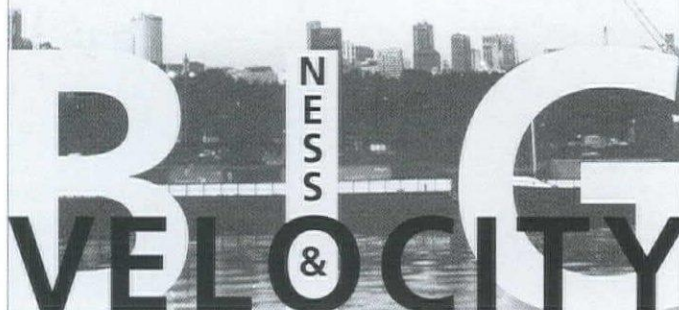
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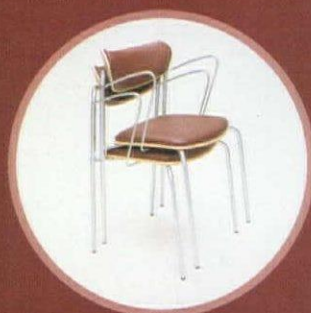
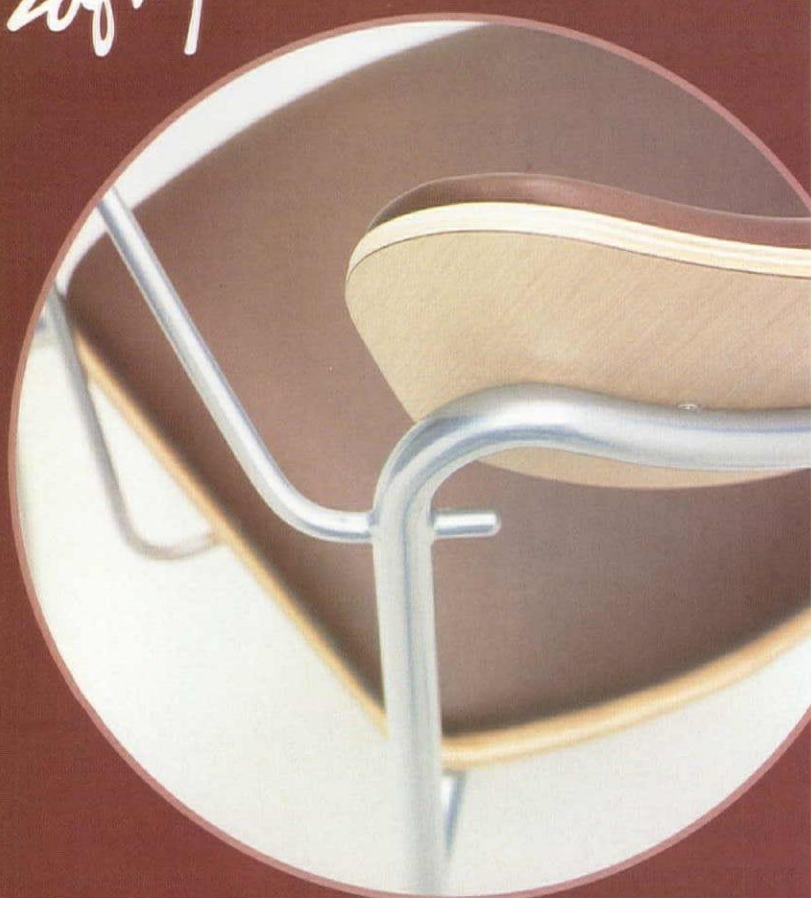
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design review

DR

Furniture fair Spectrum 99 will take place from 17-20 May in the Commonwealth Institute on Kensington High Street, London. Each year the AR gives an Award for Excellence to the product judged the most worthy by the jury, which includes Chris Wilkinson (Chris Wilkinson Architects), Matthew Wells (Techniker), Stephen Marshall (Munkenbeck & Marshall) and AR editor Peter Davey.

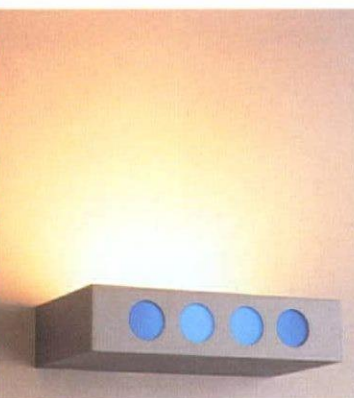
The Institute was built to mark a shift away from Britain's imperial past, to reflect its changing relationship with its former colonies. Designed by Robert Matthew, Johnson-Marshall & Partners and opened in 1962, it is a tent-like building with a central exhibition hall and a hyperbolic paraboloidal void sheathed in copper and spanning 183 feet above a concrete shell. It was constructed with gifts from the Commonwealth; Nigeria sent wood for floors and Zambia copper for the roof.

The annual Spectrum talks will take place at 6pm on Monday 17 May in the Institute's lecture theatre. This year Professor Christopher Frayling, Rector of the RCA, architect Will Alsop and fashion critic Peter York will take a light-hearted look at twentieth-century art and design, each choosing the century's most significant objects and images. Tickets are free but should be booked: tel: 0171 831 9777.

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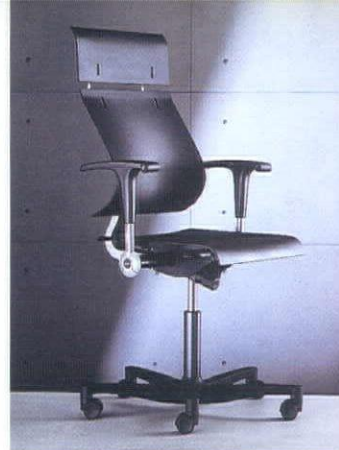
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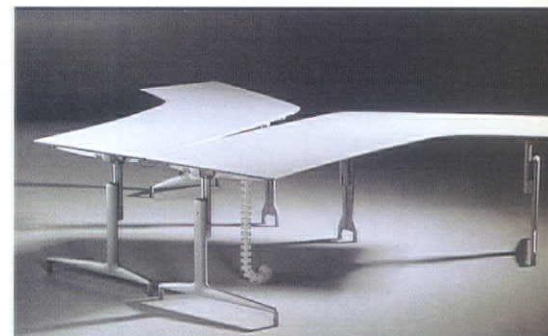
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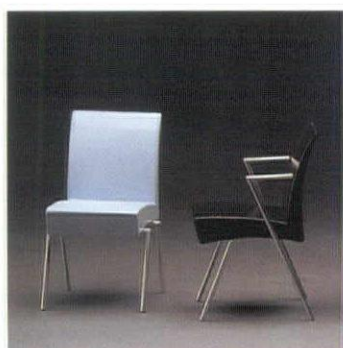
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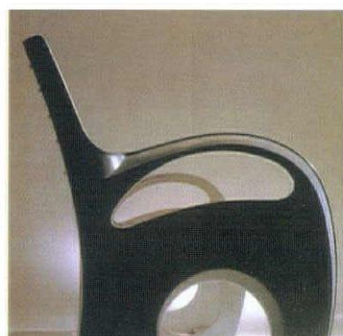


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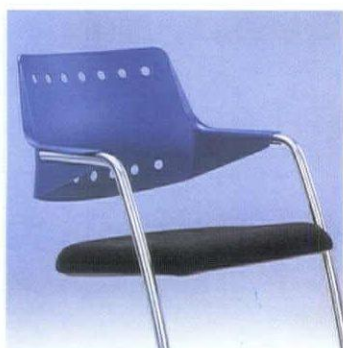
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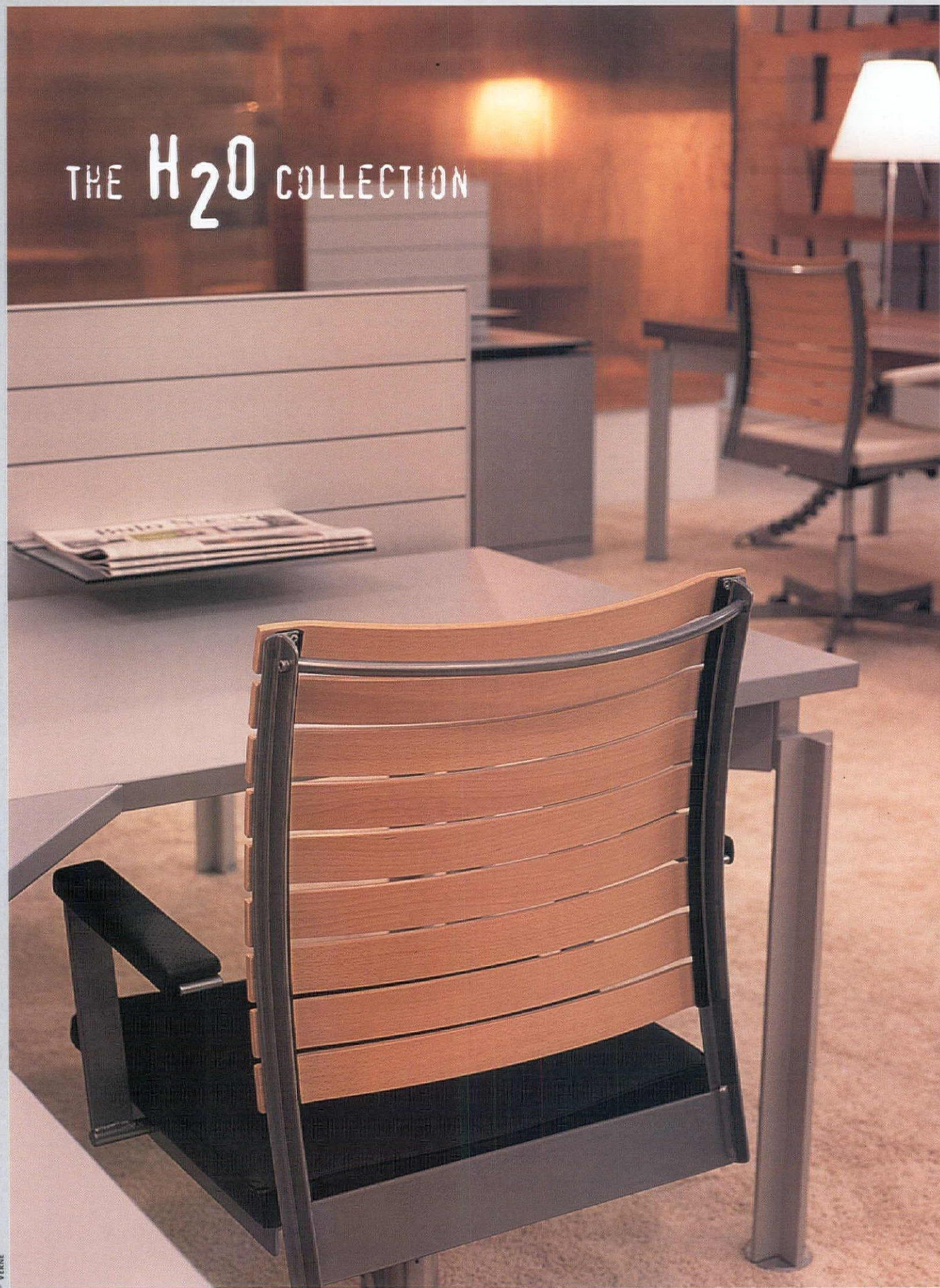
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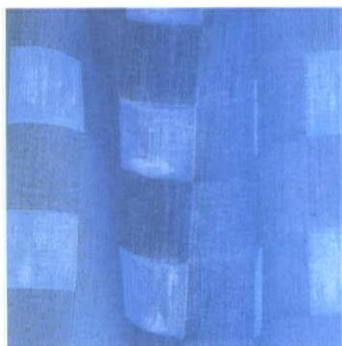
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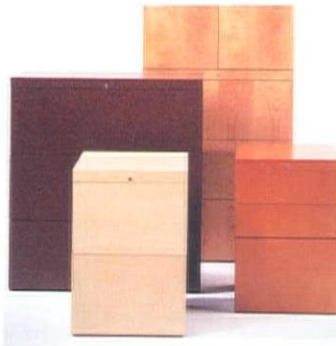
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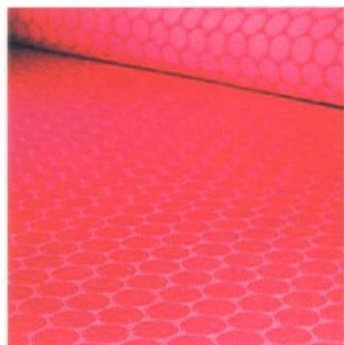
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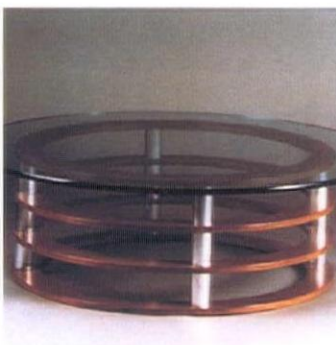
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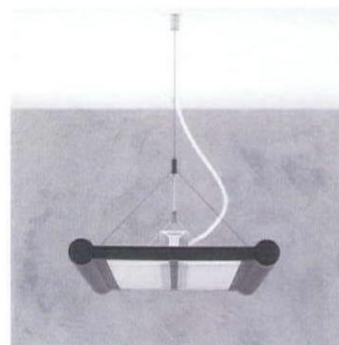
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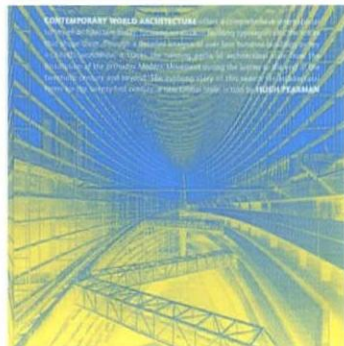
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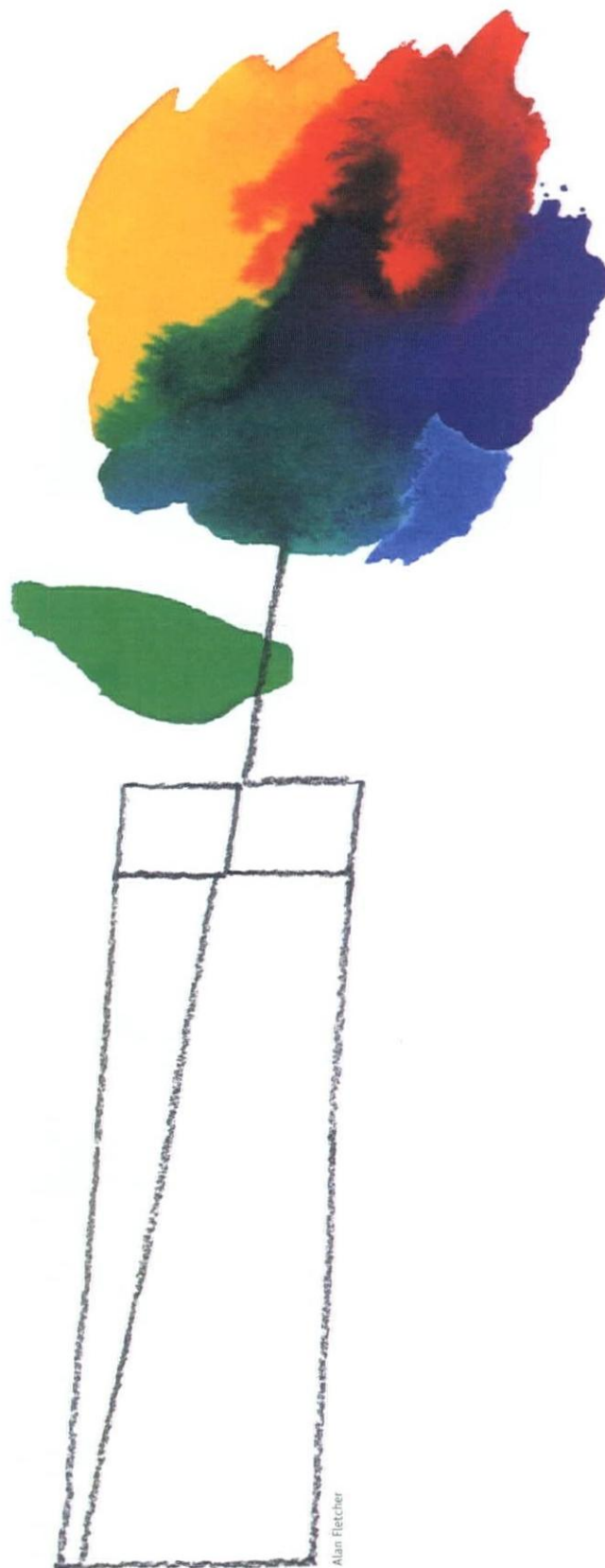
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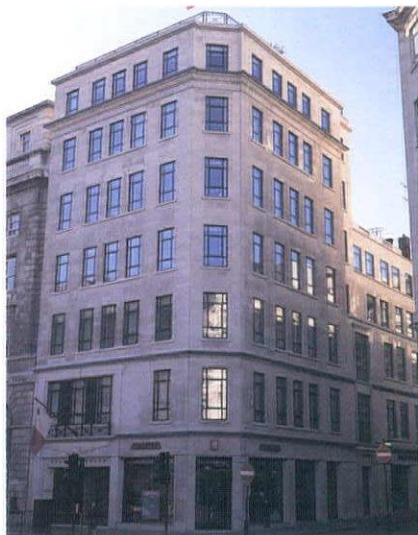
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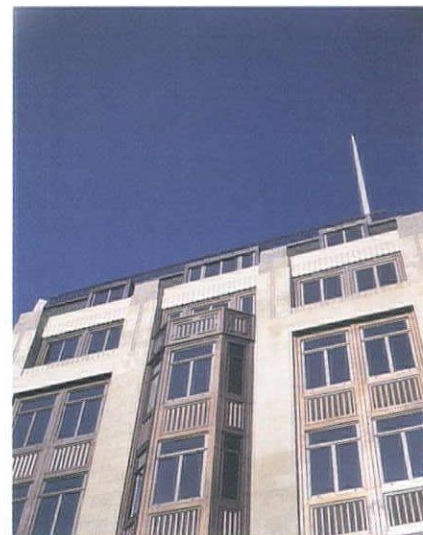
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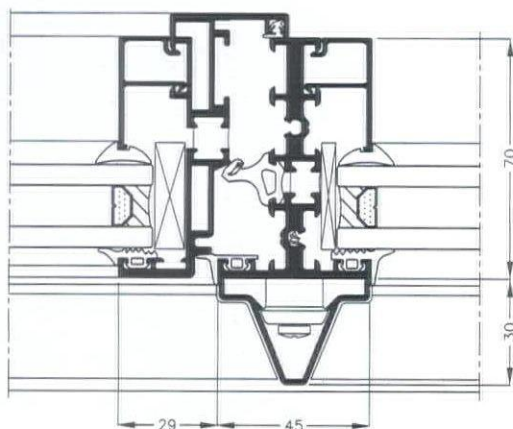
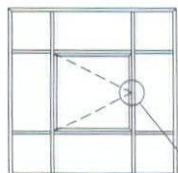
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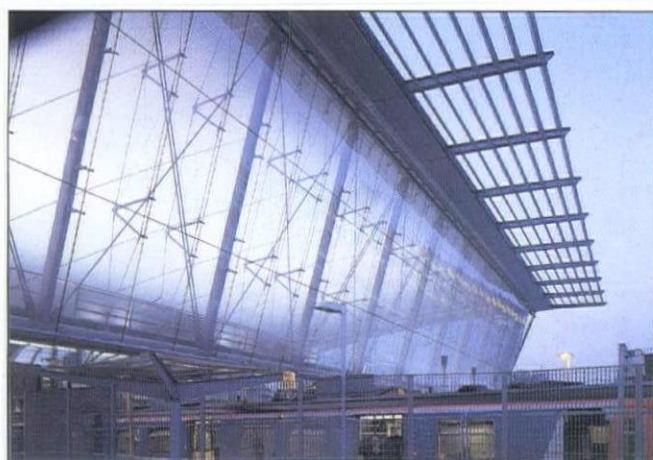
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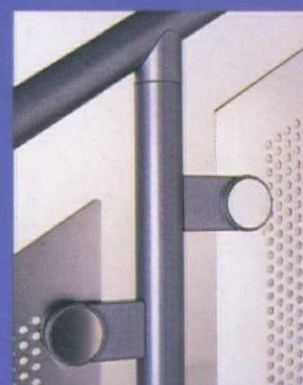
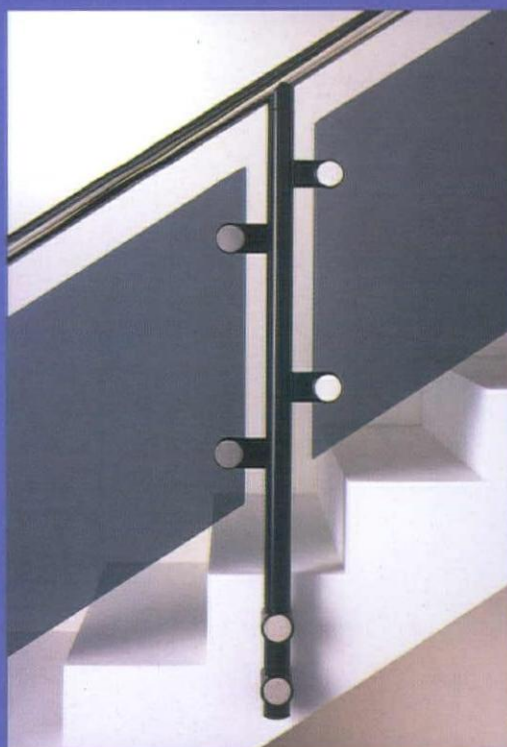
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It was curious of the Norwegian government to require that the nation's new international airport at Gardermoen should offer some of the flavour of the country (p44).¹ At first, the notion seems naïve and rather like the demands made by some developing nations a decade or two ago that indigenous cultures should be clearly expressed in their brand new buildings. These were largely built by international consultants whose comprehension of local culture was in inverse ratio to their ability to make large quantities of money and get out fast. Results of that thinking can be seen all over the world in fibreglass ogee arches, fake columns, false domes and absurd pilasters glued over standard international sheds devoted to the most utilitarian kinds of people-movement. Today, most of those acres of applied decoration are fading, and partly obliterated by extensions and advertising. (A good lesson this for all the early '90s PoMo designers: if your architecture lives by the sign, it will probably die by it as well.)

In Norway, the same kind of thinking would have resulted in a building made of logs (probably plastic), artificially weathered brickwork and perhaps a turf roof or two. Of course this did not happen, partly because lessons have been learned from the disasters of crude historicism, and partly perhaps because Norway has a long tradition of discovering its identity in the modern world, and went through its wildly eclectic nationalist phase more than a century ago. A much cooler, more abstract approach to expressing identity was attempted, and in many ways, it has worked. And it has worked because the lessons of Modernism have been understood. By using those quintessentially twentieth-century materials, reinforced concrete, large paned glass and laminated timber, the architects have made travellers aware of their routes to and from the planes, and the drama of air travel is made clear (something that Foster wanted

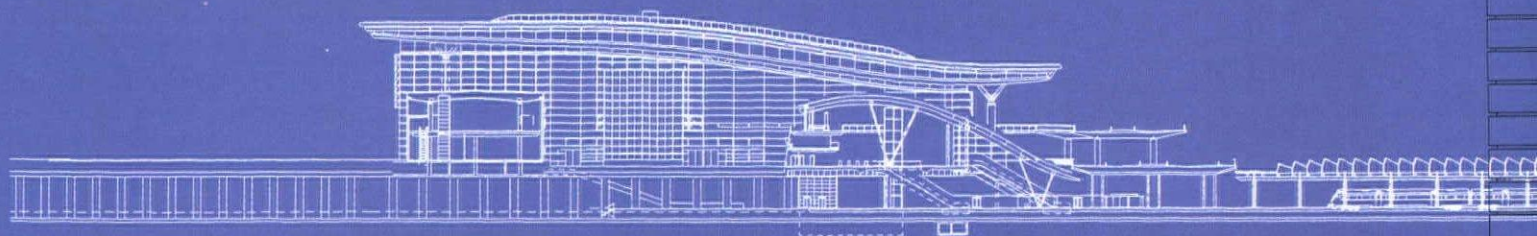
to achieve at Stansted, but was prevented by bureaucratic stolidity – AR May 1991). Above all, the airport is experientially anchored into the rolling landscape, which gives this totally twentieth-century, and usually anonymous building type a sense of location based on immemorial cultivation of field and forest.

Yet for all the abstraction they attempted, some of the architects in the group which created the building were worried about the requirement that wood should be used as a sort of advertisement for Norway's nature and its products: this, they thought, was the first step in a slippery slope that would lead to a mess of plastic trolls and *gemütlich* Norsk boutiques served by women with long blond plaits decked out in post-industrial peasant costumes. Doubtless, there will be such people in the shops. No matter how carefully controlled the signage (if the authorities can do this, they will have done better than anywhere else in the world), there can scarcely be restrictions on what people can wear. But, so far, Gardermoen remains remarkably unkitschy. It achieves identity and particularity without flaunting and appealing to the lowest common denominator. A distinct, calm place, it lets you know exactly where you are – a very rare phenomenon within the amorphous homogenized world of air travel.

Nothing can, you might think, be more unlike air travel than going by metro. Yet architectural and experiential problems are similar in some ways: large numbers of people have to be organized as reassuringly and expeditiously as possible; they have to be assisted from walking unassisted to frighteningly powerful transport machines. And, as in all other forms of mass transport, the actual experience of travelling can be very disorientating: we are marshalled forward into a world in which we are virtually powerless as individuals, a world in which there is little differentiation – for even when airborne, we are often in

MOVING PLACES

The ubiquity of modern transport is one of the greatest blessings of the modern world – and one of its greatest problems, not only by destroying the upper atmosphere but by helping generate a completely homogenized planet. Architecture can at least help counteract the latter.



Gardermoen airport by Aviaplan (p44).

the darkness of night, or in endless space hovering between a platform of grey cloud and the blue vault. In human terms, the seamless, meaningless subterranean world is not so very different from the void in the sky (except of course, that we often have to travel squashed and standing up in the tube). Metro travellers are as much in need of a sense of place as airline passengers.

Roland Paoletti, chief architect of the new extension to London's metro² network, has been quite clear about this, and clear too that thought is the answer to placelessness (p54). He had the nerve to ask nine of Britain's best architects to design stations on the new line (reserving only two for his own team to create).³ Only a very few general rules were set – for instance that the structural bones of the great engineering project⁴ should be allowed to form the spaces, which should as far as possible be illuminated by daylight, even at the lowest levels (p68), so keeping travellers in some sort of contact with time, weather and seasons. Preliminary results of Paoletti's policy are impressive. Each of the stations has particular character. Regular travellers will know where they are not just by signs but by the nature of the spaces of the stations; novices will have their journey made memorable by the succession of particular places. Even in the fabled days of the London underground system, under Frank Pick and Charles Holden,⁵ there was little attempt to differentiate between stations underground (though at street level, each of the politely urbane Dudokian stations has individual presence). Paoletti's ambition, and the built achievements, are quite remarkable: even deep stations have been given presence, and not by applying decoration.⁶

Gardermoen and the new Jubilee Line stations are powerful arguments for architecture: they make travel as convenient and direct as modern technology will allow, and they enhance expe-

riences of arrival and departure. They are above all, memorable places. In a world which is being increasingly flattened and homogenized by the often terrifying forces of capitalist globalization (which smear when they do not crush) it is essential that fixed, recognizable points can be established: ones which individuals can choose to make landmarks on their internal maps. Creation of such anchor points in the imagination is a task of architecture which distinguishes it from engineering. Perhaps it is the chief one. It is ironical but very encouraging that such good examples as those in this issue have emerged from a sector of activity as grimly reductive as modern transport, dominated as it is by civil and mechanical engineering, and which is itself a major force for erosion of the once wondrous variety of the world. With such buildings, architecture introduces a powerful humane antithesis to the usually dreary normative world of transport. We need more of them. P.D.

1 In fact, the Norwegian government has a policy of trying to ensure that public buildings should set a high standard of design (AR August 1993). Gardermoen could be seen to be a specific extension of the approach.

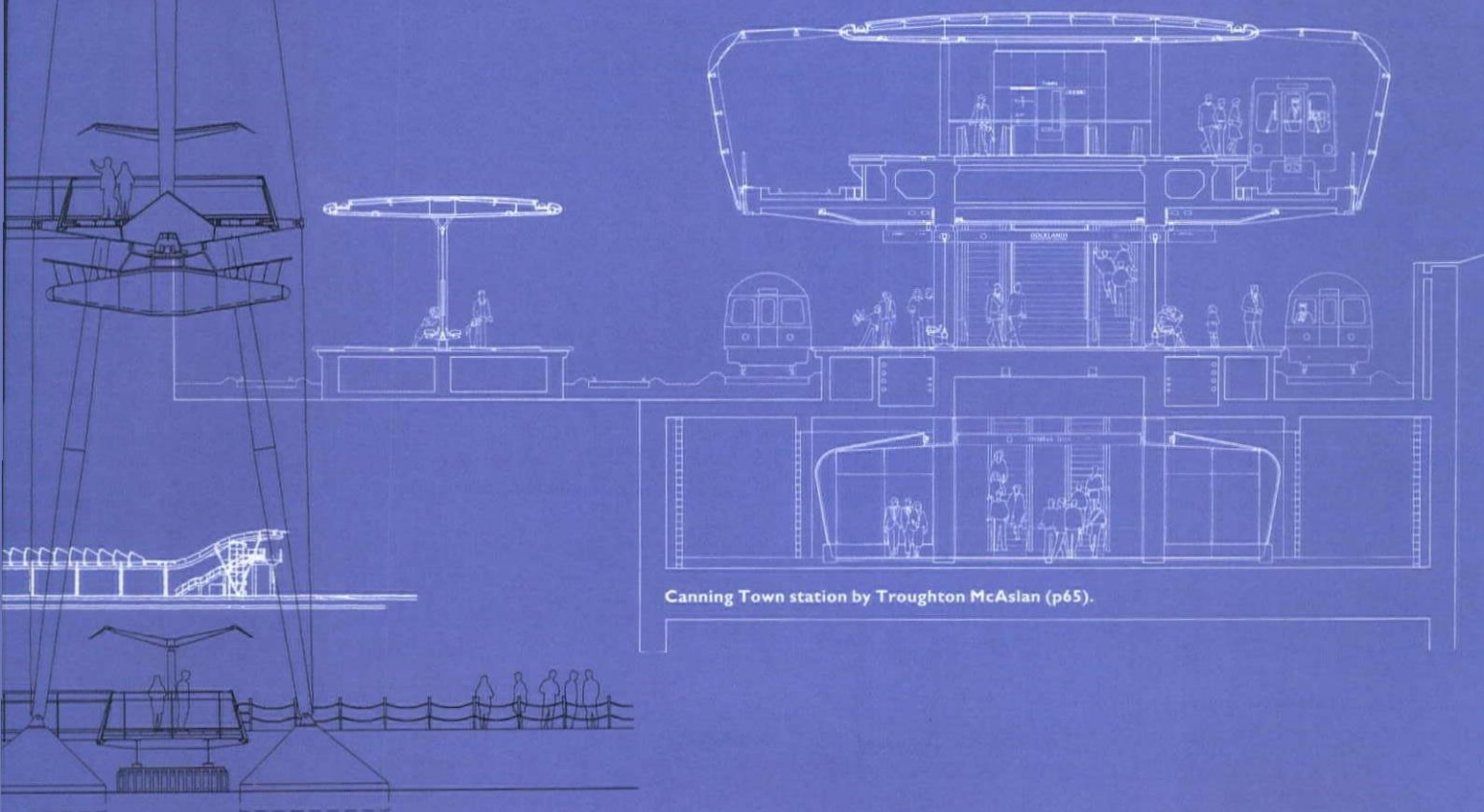
2 There is a myth (denied by some) that the international word 'metro' is a French shortening of 'Metropolitan Railway', the first urban underground railway in the world built in London in the 1860s.

3 The line is the more remarkable because planning for it started under the Conservative government, which was opposed to public transport in general and rail in particular. The crass development of London's Docklands (in which some of the most gross buildings in Europe were thrown up by hugely subsidized private capitalists) was served only by the ramshackle, groaning Docklands Light Railway, so a proper mass transit system was much needed.

4 It is one of the most difficult lines ever built because of the complexity of the land through which it goes, permeated by centuries-old pollution, service routes, sewers and underground rivers – and of course, other railways.

5 Frank Pick was Director of the London Passenger Transport Board and Charles Holden was the chief architectural consultant.

6 A policy adopted in other parts of London Underground and elsewhere, not entirely unsuccessfully: think for instance of the Louvre station in Paris, or Eduardo Paolozzi's decorations at Tottenham Court Road in London.



Canning Town station by Troughton McAslan (p65).



AIRPORT, GARDERMOEN, OSLO, NORWAY

ARCHITECT

AVIAPLAN

Since flying began, Oslo airport was at Fornebu, not far from the city centre on the west side of the Fjord. It was in many ways very convenient, and even into the '80s, it offered visitors a strong flavour of Norway as they struggled from planes to terminal across the tarmac, inhaling a heady mixture of scents of pines and the sea, all heavily flavoured with kerosene. The big, rounded, forest-covered hills of southern Norway were just beyond the surrounding suburbs. Of late, the place has been updated, and become very similar to hundreds of other examples of the type all over the world. But the site was constricted, precluding expansion (the great necessity of all modern airports); local suburbanites objected to the noise and pollution (why do people who buy houses near an airport always go on like this?). And developers could see huge opportunities in a large, essentially empty site so close to the centre, yet on the sea.

So in the early '90s, the Norwegian government took the decision to build a new airport to the north of the city at Gardermoen, a moor in the gently rolling forested landscape of Akershus county. Extraordinarily, Parliament required that the building should in some way evoke Norway, just as old Fornebu used to (though of course in a different way). The designers were required to make the place both a high-tech airport, and an example of Norwegian byggeskikk, which some have translated as 'Norwegian vernacular' – but it is obviously absurd to suppose that a modern airport could be created out of logs, and a better interpretation might be 'Norwegian practice', or perhaps 'custom'. Norwegian politicians are more sophisticated than most when it comes to making the environment, and have rules that all public buildings should be examples of good quality in architecture.²

A company, OSL, was set up to act as client, and it was required to install systems to ensure that both quality and atmospheric requirements could be met. Surveys of lay opinion resulted in broad guidelines about Norwegian-ness today: 'Prudence, closeness to nature, an open and egalitarian society and good usage of local resources'³ were held to be characteristics which applied as much to modern as traditional architecture. OSL produced a handbook to which all designers

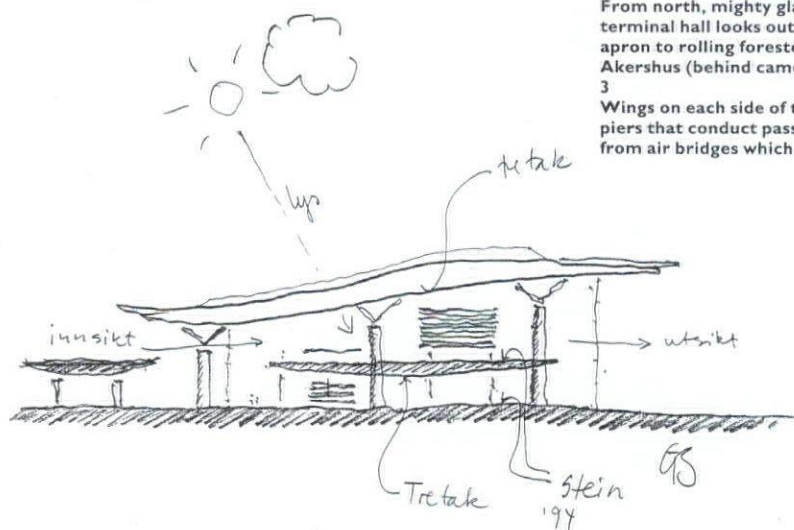
THE FLYING NORSEMEN

An airport planned with great clarity and attention to human factors was required by the Norwegian government to be an advertisement for the country. The architects have ingeniously avoided kitsch in pursuit of ethos.

1 Road arrivals are at first floor level, from where you walk across bridges to departures level in main terminal.

2 From north, mighty glass wall of main terminal hall looks out over planes and apron to rolling forested landscape of Akershus (behind camera)

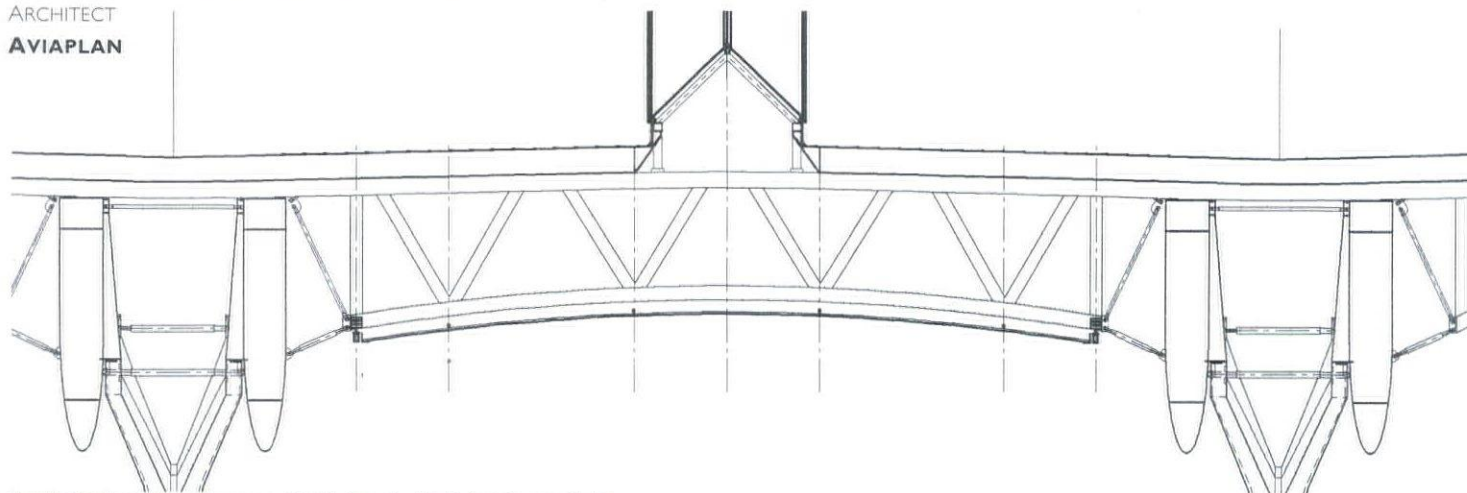
3 Wings on each side of terminal hall are piers that conduct passengers to and from air bridges which connect to planes.



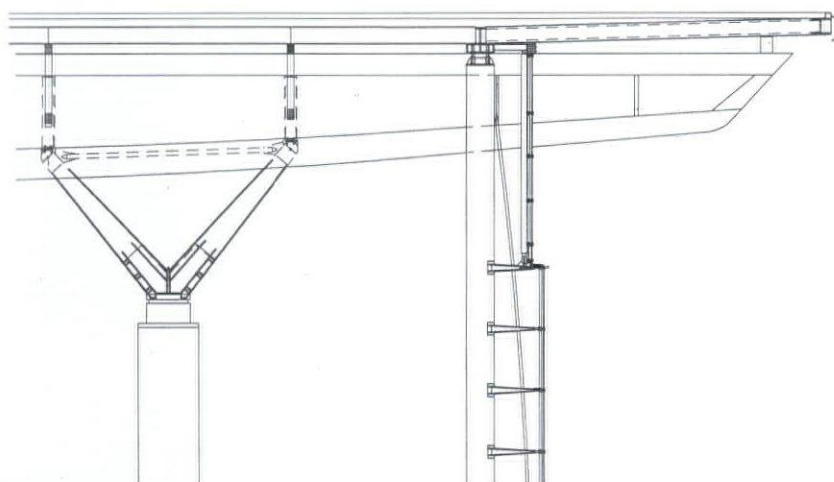


AIRPORT, GARDERMOEN, OSLO, NORWAY

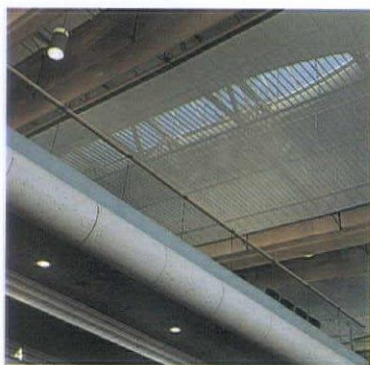
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detail of column to beam connection in terminal hall showing rooflight



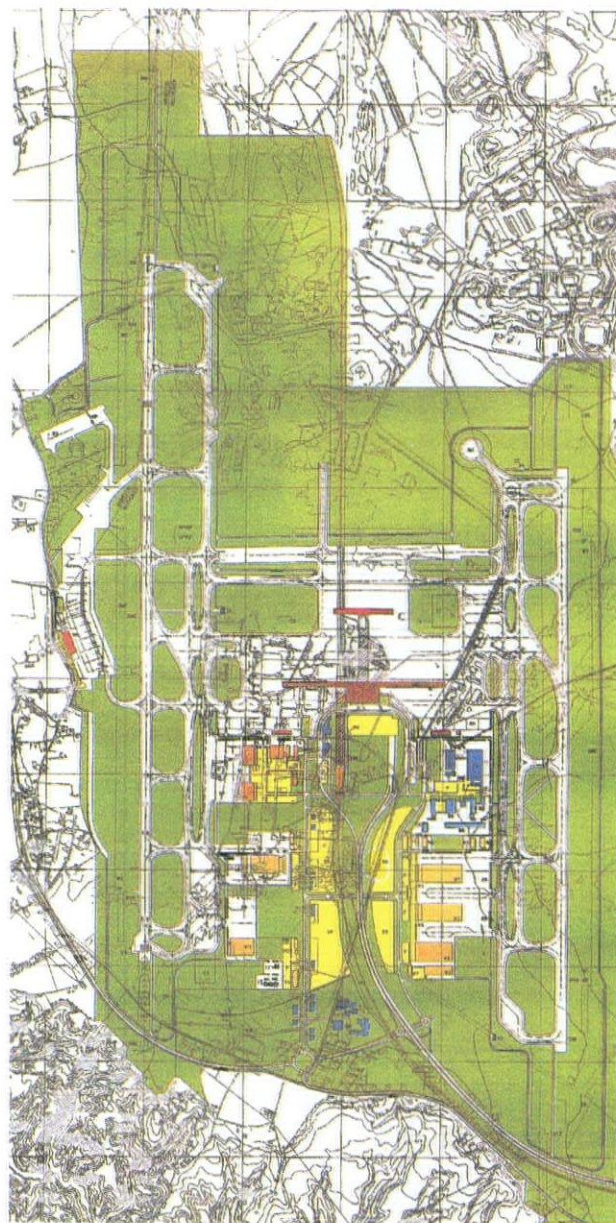
detail of north roof edge of terminal hall (scale approx 1:170)



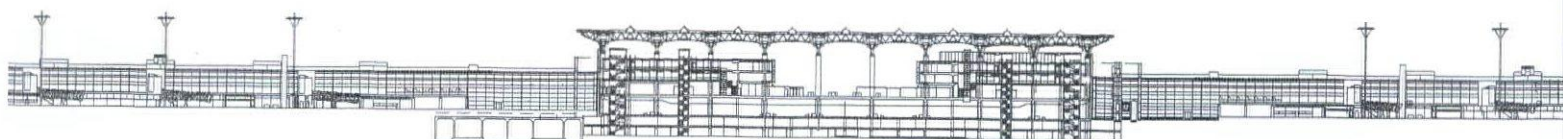
4
Detail of roof of main terminal hall showing rooflights shining through perforated metal ceiling.



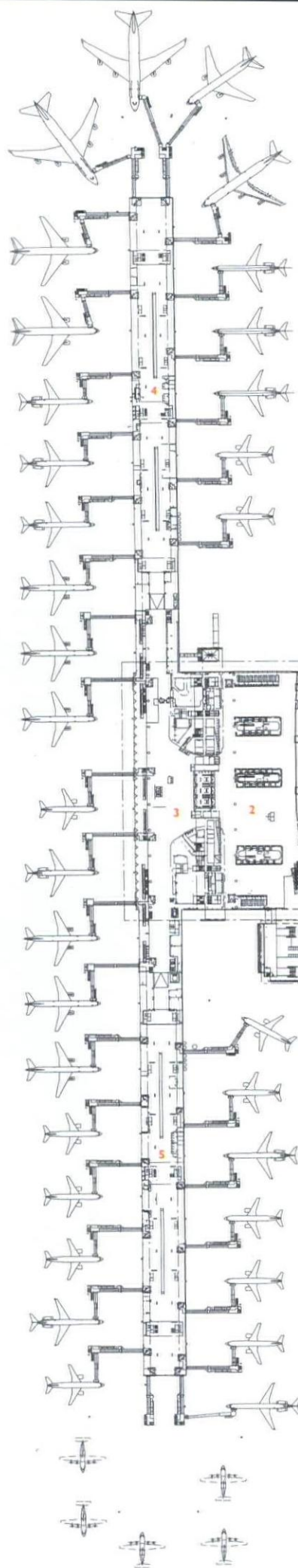
cross section through pier and air bridges



site plan

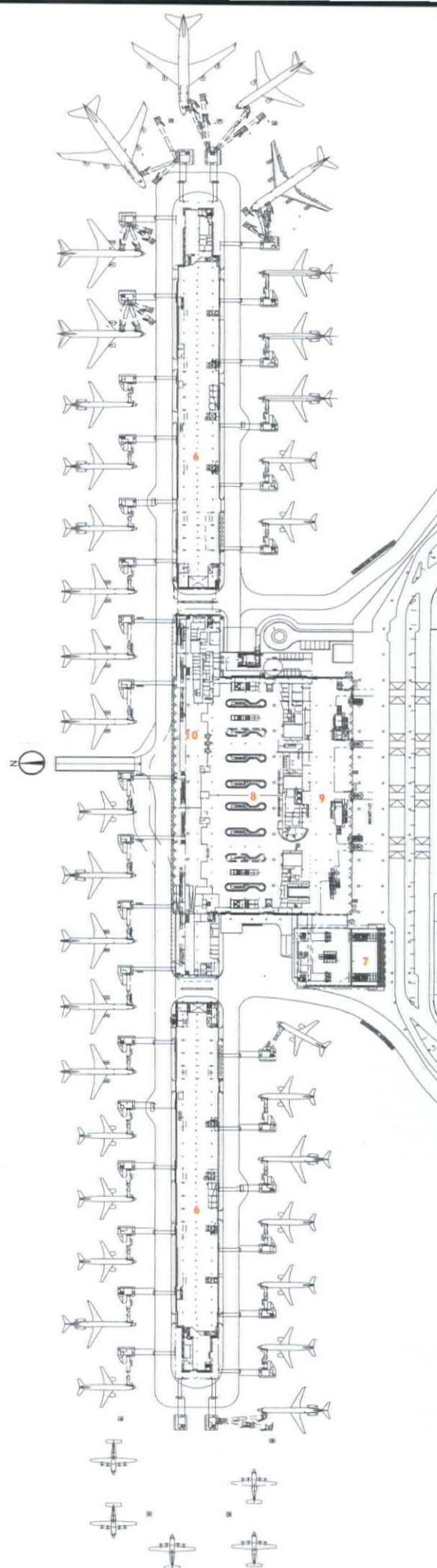


long section through terminal hall



- 1 high level approach road
- 2 check-in
- 3 security
- 4 international departures
- 5 domestic departures
- 6 baggage handling
- 7 station
- 8 baggage hall
- 9 arrivals hall
- 10 customs

upper level (departures). Scale approx 1:3500



ground level (arrivals)

AIRPORT, GARDERMOEN, OSLO, NORWAY

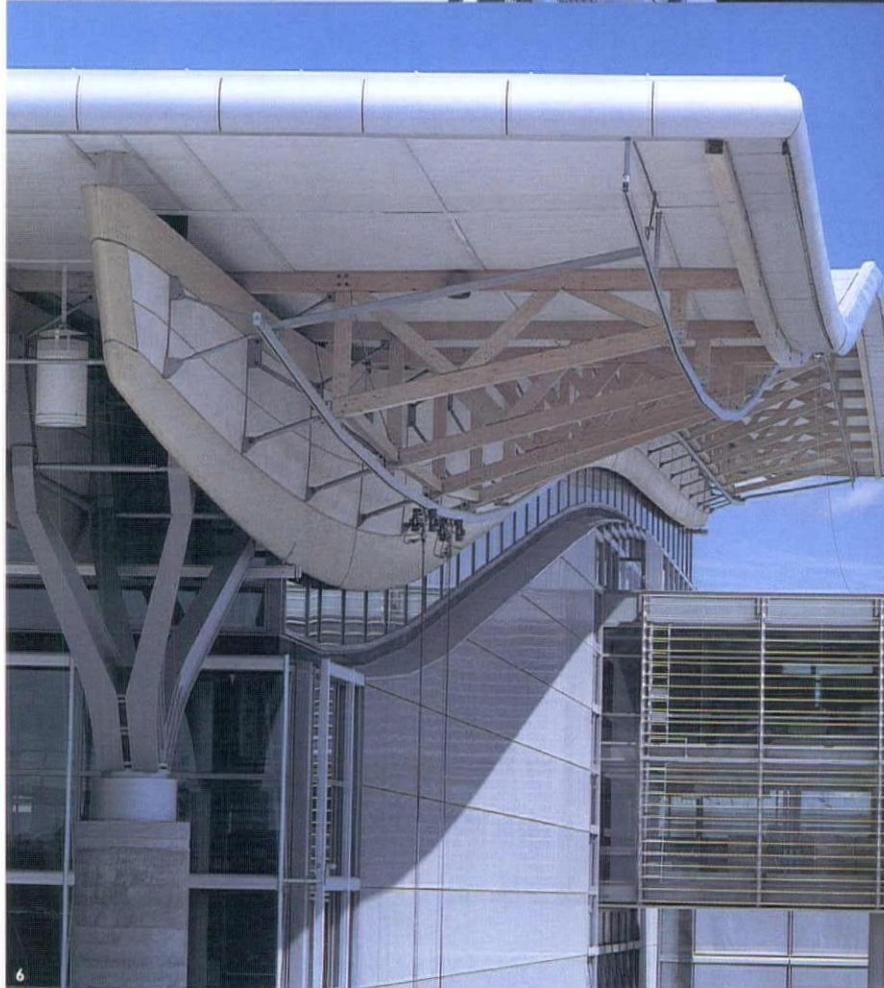
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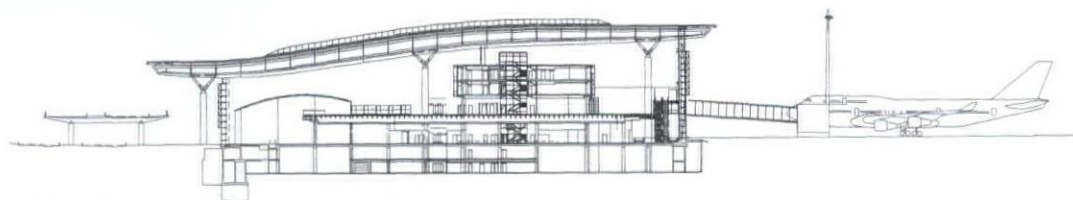
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were required to conform.⁴ This sounds unbearably bureaucratic and rigid, but in fact the policy has produced a crop of varied and well designed buildings by different architects, including a hotel, the plant centre (district heating, reserve power station and so on), a railway station (for the new line that runs up from the main station in the city), a customs headquarters and of course the control tower and terminal building by Aviaplan, a consortium specially forged for Norway's biggest ever building project by four local firms and a Danish one.

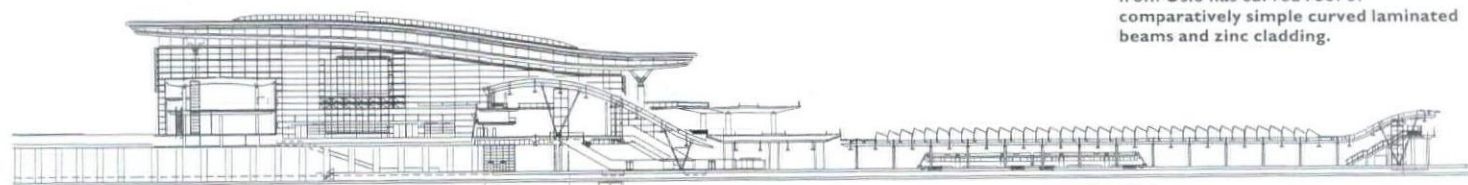
The terminal and tower were defined in the handbook as the most important elements in the complex, which is laid out between two parallel runways orientated north to south. The terminal looks north over an apparently almost untouched landscape covered in birch and pine, while to the south are grouped the ancillary buildings, roads and railway in a landscape which has been divided into large open-air rooms by belts of deciduous trees, birch again, but with broader leaved ones like maple as well. Overall planning is very simple: more buildings can be added north and south as need demands. Wings extend east and west from the terminal forming the first pier of the airport (a pier is where the planes pull up, and passengers get on and off). A further pier is planned to the north parallel to this first one, and there is provision for a third north of that. These future buildings will be linked to the terminal by a tunnel under the apron and taxiways, made wide enough to accommodate some kind of mechanical transport.

The central terminal is extremely simple in concept: a big hall with a roof that swoops upwards towards a great window-wall to the north. Arrivals are at ground level in the hall with departures on an upper level that floats above. You turn up by car or bus at first floor level and go straight across bridges through the glass wall (much lower on this side to reduce insolation). On reaching the departures area, ticketing offices and check-in desks are encountered, but the main sensation is being drawn forward towards the planes and landscape. Aviaplan has succeeded in creating the dramatic visual link between arrival and planes that Foster wanted to make at Stansted;⁵ a strategy that was in the end defeated in the English airport by the demands of customs and security organizations. By separating arrivals and departures vertically, some of the problems encountered at Stansted have been avoided. Once past security arrangements, passengers





south-north cross section through terminal hall



north-south section through station with west elevation of terminal hall

5 From approach road.

6 Roof construction becomes very clear at edges, with curved beams exposing their laminated top and bottom booms, and lattice-work secondary trusses cantilevering to support roof edge.

7 Pier with air bridges.

8 New station for dedicated rail line to and from Oslo has curved roof of comparatively simple curved laminated beams and zinc cladding.

AIRPORT, GARDERMOEN, OSLO, NORWAY

ARCHITECT
AVIAPLAN

turn left for inland journeys and right (east) to passport control for international flights. The long wings are of course fitted with travelators which whirl you to your gate, with its waiting area fitted out in specially designed seating of leather, steel and wood.

Arriving passengers come in from the air-bridges at a higher level and are conveyed on 4m wide galleries towards the big terminal shed in the middle of the plan. Galleries are connected by bridges, which visually divide the 18m wide central void into distinct episodes, and further spatial division of the long space inside the piers is provided by services shafts set 36m apart down the length of the wing. From the galleries, arriving people are led by escalator or lift down past departure level to ground level, where they encounter passport controls and baggage carousels, and then progress to the buses and taxis waiting outside (or to the escalators down to the station).⁶

As the rules laid down that Norwegian materials should be used, the roof structure is of wood (a decision that was not popular with all the architects, some of whom thought that it was naively folklorish compared to the steel structure they first suggested when they started work in 1990). In fact, the result is elegant. Paired curving beams are supported by cast steel capitals on top of big round concrete columns, set at 18m centres and positioned in threes to allow the double curve to be divided into two spans. (Such concrete construction is regarded as a Norwegian speciality since it was extensively used to support North Sea oil platforms). The swooping beams have top and bottom booms of laminated timber connected by paired plywood webs. Only the bottom booms can be seen clearly, and they are carefully shaped with the human roundness of bats or hockey sticks. Between the pairs of beams is white perforated metal, which acts as a diffuser for the luminance of strips of rooflights. Through the metal veil can be dimly seen the upper parts of the main beams and the timber lattice secondary structures which connect them. At night, the perforated metal acts as a reflector for uplighters, throwing luminance down onto the light wood and veined grey marble floor of the departures level, or further down to the dark Norwegian slate of the arrivals hall.

Wood is everywhere in the interior, forming the check-in desks, the waiting area floors, bar panelling, the ceiling of the arrivals hall and the elegant horizontal



9
Arrivals level: massive columns, which give something of a gothic effect, were judged to be Norwegian because of North Sea oil platform experience.

10
Looking down to arrivals level of terminal hall from departures.

11
Check-in desk island at departure level.

12
Ticketing desks at departure level.

13
Offices which emerge into terminal hall are given fixed wooden privacy screens.



AIRPORT, GARDERMOEN, OSLO, NORWAY

ARCHITECT

AVIAPLAN

screens round the stubby glass office towers that pop up at departure level in the big space. It could all be very kitsch, but the rigorous self-discipline of the large team of architects has ensured that, by and large, everything is done with grace and dignity. And for all the specified Norwegian-ness, as Christian Norberg-Schulz has remarked, 'there is no aim to invoke a nationalistic adaptation of a cosy tradition, but ... to show that we have arrived at this place, a truthful expression of time'.⁷ It is to be hoped that the handbook of visual rules will remain in force to suppress the horrible proliferation of commercial signs and other muck which messes up practically every airport in the world (and has, for instance, practically wrecked Stansted visually). If that could be achieved, arrival at Gardermoen will continue to be a remarkable, particular and calming experience that speaks of a civilized society. For all its initial problems (for instance the roads were not properly finished when the place opened) Oslo's new airport looks as if it may continue to be that real rarity in air travel: a place. HENRY MILES

1 See for instance *Byggekunst*, 1 1999, p16.

2 See AR August 1993. In fact, the policy does not always translate properly into practice because competitive tendering on price grounds plays a major part in building procurement.

3 *Byggekunst op cit* p18.

4 See *Byggekunst* 1 1995.

5 See AR May 1991.

6 Luggage is taken on conveyers from check-in gates down to central sorting hall below ground level. It is then taken at 40km/h by electrically driven automatic carts under the piers to the gate nearest the relevant plane. The system is broadly similar in reverse, with baggage delivered to carousels at arrivals level in the hall.

7 Norberg-Schulz, Christian, 'Storrommets Arkitektur', *Byggekunst* 1 1999, p48 (author's translation).

Architect

Avioplan, Oslo

Project leader

Gudmund Stokke

Concept group

Niels Torp, Hans Haagensen, Ole Wiig

Project team

Ole Tørklep, John Arne Bjørknes, Geoffrey Clark, Bernhard Dahle/Torben S. Jensen, Per Suul, Pål Laurantzon, Christian Henriksen, Jan Ellef Søyland, Ninni Gøranson, Roald Sand, Åke Letting

Structural engineer

Chris Wise, Ove Arup & Partners

Lighting

Andre Tammes, Lighting Design Partnership

Mechanical engineer

Reinertsen Gruppen

IT systems

IGP

Photographs

Terje Agnalt 1, 4, 6, 7, 8, 11, 12, 14, 16, 17

Damian Heimisch 5

Guy Fehn 2, 3, 9, 10, 13, 15





16

14
Looking down onto restaurant at arrivals level.

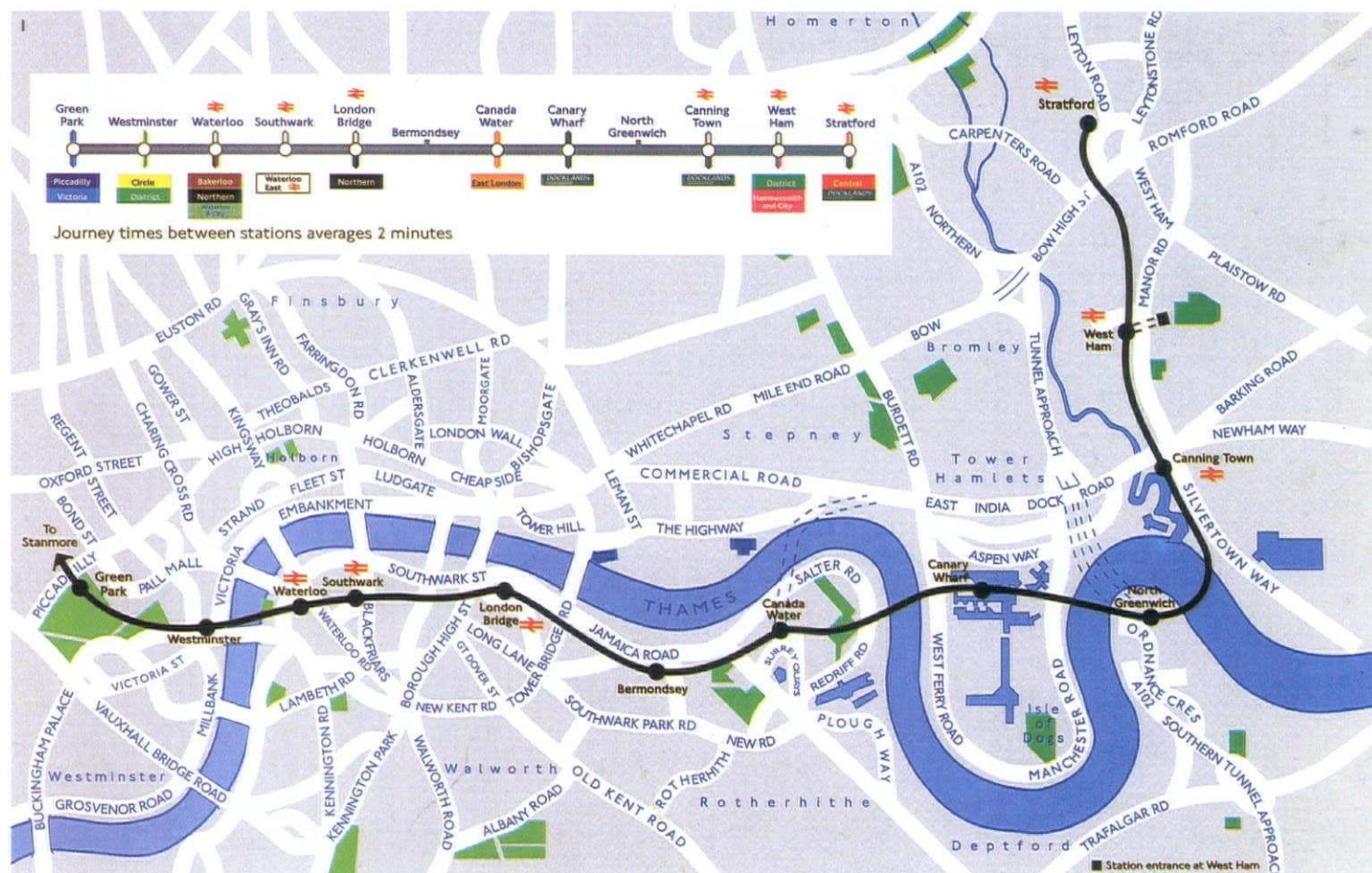
15
Great glass wall of terminal hall looks north. It is supported on steel tubes.

16
Entering one of the piers from hall ...

17
... to walk to waiting area by departure gate on same level. Arriving passengers come in at upper level and are conveyed by lift and escalator down to arrivals level below departures in main hall. Seating by Sven Ivar Dysthe.



Underground jubilation



The oldest metro system in the world, London Underground first opened in 1863, with steam trains running along four miles of track between Paddington and Farringdon Street. Now the vast, sprawling network covers 254 miles (over 400km), with 11 lines and 270 stations. The notion of a line serving the south and east parts of London was first proposed in 1949, but it was not until the 1970s that the need for improved connections to Docklands and their hinterlands began to be acted upon. The transformation of the area into a new financial and residential centre helped to provide the necessary impetus and in late 1993, the government finally granted approval for a new route.

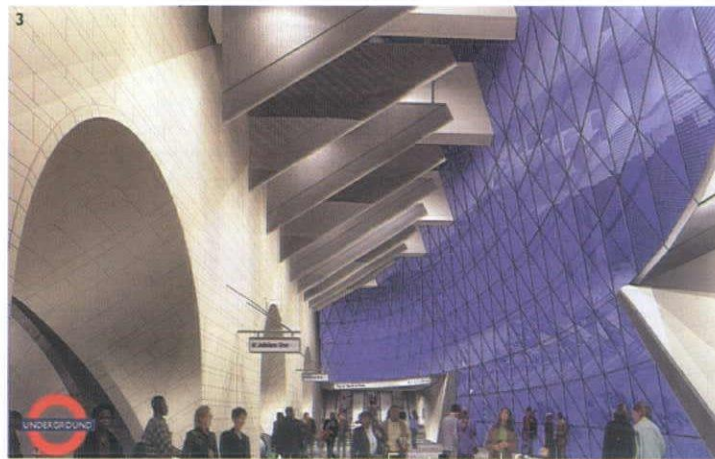
The Jubilee Line Extension (JLE) augments the existing Jubilee Line (completed in 1977) which runs from Charing Cross in central London to the north-western suburb of Stanmore. Beginning at Green Park in the West End¹ the new extension will provide a high capacity, fast connection between the Isle of Dogs in Docklands and Stratford to the east. The line will also have wider benefits for Londoners, bringing the Underground to areas of the city that previously lacked an efficient metro link, such as North Greenwich and Bermondsey. South-east London and Kent will be opened up to park and ride commuting, helping to reduce road traffic into the centre of the capital, and international connections will be improved at Stratford and Waterloo (AR September 1993). The first phase of the new line, from Stratford to North Greenwich, is now nearing

completion, with the remaining section from North Greenwich to Green Park due to open in the late autumn.

The scale of the JLE operation is staggering. Encompassing eleven station sites, six main tunnel sites, one depot and 18 operating sites, it is the largest construction project in Europe and the most complex tunnelling operation ever carried out below London. Crossing under the River Thames four times, 12.2km of twin-bore tunnels ranging from depths of 15 to 30m have been laboriously hewn under densely built London. The final section of the line (from Canning Town to Stratford) is above ground. Six of the stations on the new route have been purpose designed, with the remaining five radically refurbished and modernised. All vary in their urban settings and relationships with existing transport links. Some are underground – Westminster and North Greenwich, for instance, are huge subterranean caverns, excavated deep into the earth. Others, such as Canning Town and West Ham, resemble suburban outposts with surface platforms and ticket offices.

Coordinating this huge enterprise is Roland Paoletti, the JLE's chief architect and 'Medici of the Underground', who was responsible for commissioning the new stations. In an act of conspicuously enlightened patronage (rare enough in Britain and particularly so for a public transport project), Paoletti selected established, contemporary architects to design nine of the stations², with the remaining two (Waterloo and Canada Water) being handled by an in-

The new Jubilee Line extension is London's most important transport infrastructure project for more than a decade. The commissioning and design of its eleven new stations is also an enlightened act of patronage which aims to revitalise public transport in the city. Here we examine the background to the project and go on to consider individual stations in the first completed phase. We will return to the second phase in a later issue.



1
New line extends network south of river and to east. Stratford to North Greenwich are virtually complete.

AS YET UNFINISHED STATIONS:

2
Bermondsey by Ian Ritchie

3
Southwark by MacCormac Jamieson Prichard.

4,5
Canary Wharf by Foster & Partners



house JLE team. Beyond ordering certain standard components and materials, such as terrazzo flooring, escalators, glazed platform doors and signage, Paoletti did not attempt to impose specific design guidelines. Instead, his coterie of architects have been encouraged to celebrate the powerful civil engineering forms intrinsic to the project, and as a result the stations share a common language of sleek, hard edged functionalism that synthesises architecture and engineering to generate its own austere elegance. Such precedents were established by Frank Pick and Charles Holden's iconic underground stations of the early 1930s. Inspired by Dutch and Scandinavian Modernism, Pick and Holden's simple geometric massing, uncluttered brickwork and clean lines provided the newly united London Underground with a progressive yet rational corporate image.

Wherever possible, natural light is channelled and reflected into the station concourses, temporarily dispelling the memory of the cramped, dingy conditions that still obtain across much of the existing Underground network. At Bermondsey, for example, designed by Ian Ritchie, the new concourse is bathed in daylight which floods in through the clear glass roof and walls of the ground floor ticket hall. At Southwark (by MacCormac Jamieson Prichard) the station is organised around a dramatic half-conical subterranean hall, four storeys high. Daylight streams down through a large rooflight just above ground level and shimmers through a spectacular curving glass wall made up of triangular glass panels patterned in myriad vivid blue

stripes. And at Foster & Partner's Canary Wharf, two delicate, elliptical glass canopies (evolved from the practice's designs for the Bilbao metro – AR May 1997) efficiently diffuse light into the bowels of the station below. At night, the canopies will glow softly, illuminating the surrounding landscape.

Inevitably, the sheer scale and overwhelming complexity of the overall project have given rise to delays and overruns. Originally due for completion in spring 1998, the new line will now be in service by the end of this year. The cost has also risen, from an original budget of £2.1 billion to current estimates of £2.76 billion. Some of this shortfall will have to come from London Underground's capital budget, and it has been argued that this will reduce resources for improvements elsewhere on the network. Yet the JLE still represents a considerable achievement, both in terms of engineering prowess and architectural imagination. Its gleaming, airy stations will finally connect south and east London with the city centre, serving to improve the lot of Londoners and setting challenging new standards for the capital's future transport projects. CATHERINE SLESSOR

1 The existing Jubilee line from Green Park to Charing Cross will become a subsidiary spur for occasional use.

2 The full list of JLE architects is as follows: Westminster – Michael Hopkins & Partners; Waterloo – JLE Architects; Southwark – MacCormac Jamieson Prichard; London Bridge – Weston Williamson; Bermondsey – Ian Ritchie; Canada Water – JLE Architects; Canary Wharf – Foster & Partners; North Greenwich – Alsop Lyall & Störmer Architects; Canning Town – John McAslan & Partners; West Ham – van Heyningen & Howard; Stratford – Chris Wilkinson Architects.

JUBILEE TERMINATION

A remarkably satisfactory organic symbiosis between structure and climate control forms a fitting climax to the Jubilee Line Extension.

The new station in Stratford, east London is a remarkably satisfactory building because its form integrates function, structure and climate control in the way a tree does. The label 'organic' has been attached to all sorts of approaches to architecture, but for once it seems absolutely appropriate.

Chris Wilkinson was faced with a very complicated problem when he won the invited competition to make a station that would link several separate rail systems: the North London Line which here runs roughly north-south, and east-west the Central Line (part of London's metro system) and another part of the national rail system running approximately parallel to it. And it had to act as terminus for the Jubilee Line Extension, which runs parallel to the North London tracks. To make things even more complicated, the virtually forgotten Channelsea river runs under part of the site.

Wilkinson's response to the cat's cradle of tracks was bold and apparently simple. A big shed, rectangular in plan, has been created parallel to the embankment of the Central Line. A great glass wall, heavily shaded by the projecting roof, looks south-east towards the spiky outline of Stratford's new bus station (the whole area is supposed to be a transport interchange and catalyst for vitalizing an area of London that has since Chaucer's time been a by-word for provinciality).

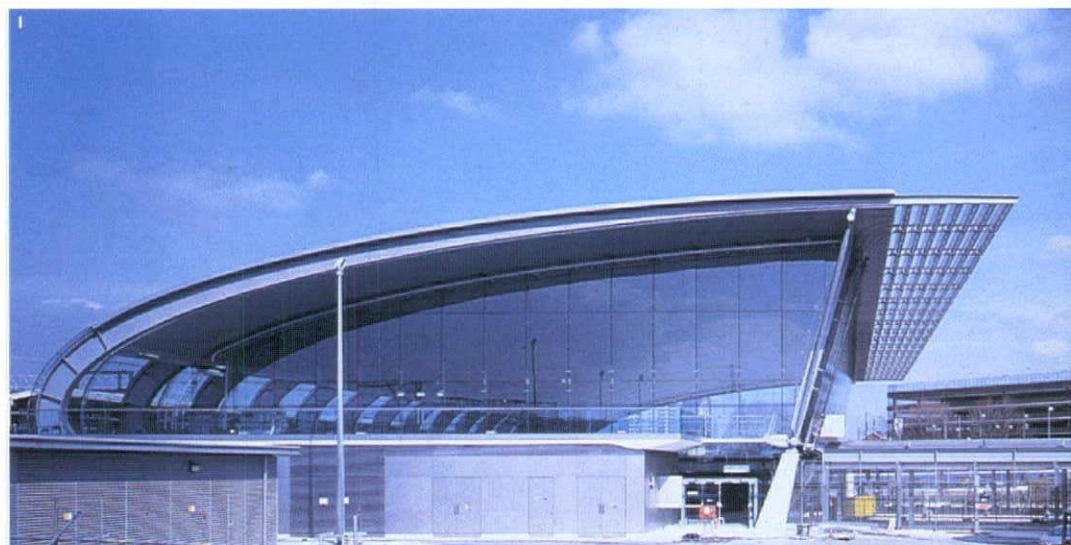
The space enclosed in the glass and metal envelope is chopped in half by the tracks of the North London Line, which go under the lines up on the embankment. So there is an east and a west concourse on each side of the North London Line. The two are linked by a walkway over the tracks which is reached by lifts, stairs and escalators. The concourses are connected to the still rather seedy platforms serving the tracks up on the embankment by pedestrian subways and lifts (one of these tunnels existed and has been upgraded, the other was created by literally shoving precast box sections through the embankment with rams – all the existing

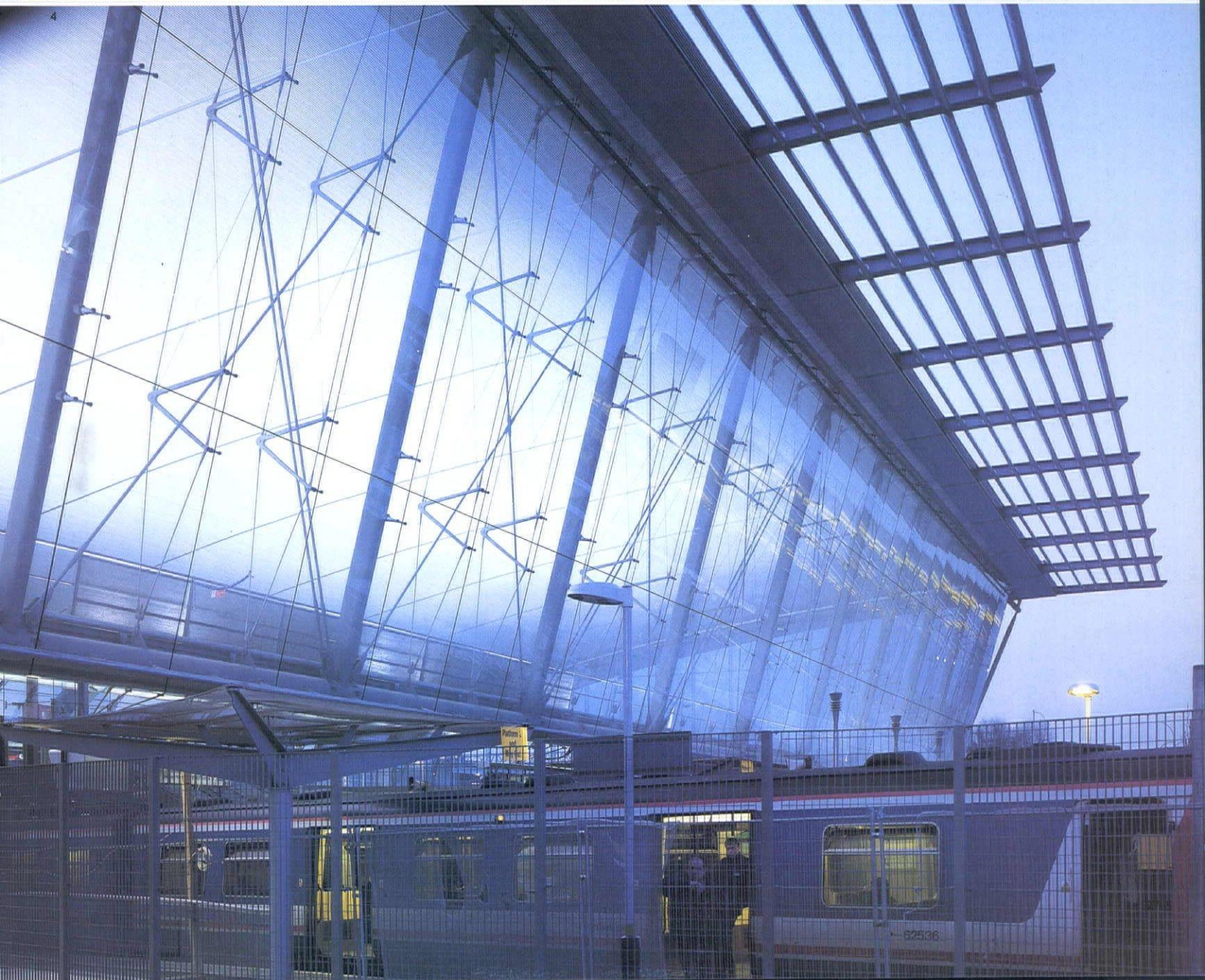
STRATFORD STATION, LONDON

ARCHITECT

CHRIS WILKINSON ARCHITECTS

- 1 From west, construction and volume of noble shed are made quite clear.
- 2 Curved cantilevered plate girders of roof are supported on inclined steel posts (see 4 and 5).
- 3 At night, the place becomes a landmark in what was a singularly undistinguished area.
- 4 Steel props of glazed south wall are connected by horizontal tubular members and diagonal bracing to form a gigantic truss. Fixed louvres in roof overhang prevent excessive sun on glass.

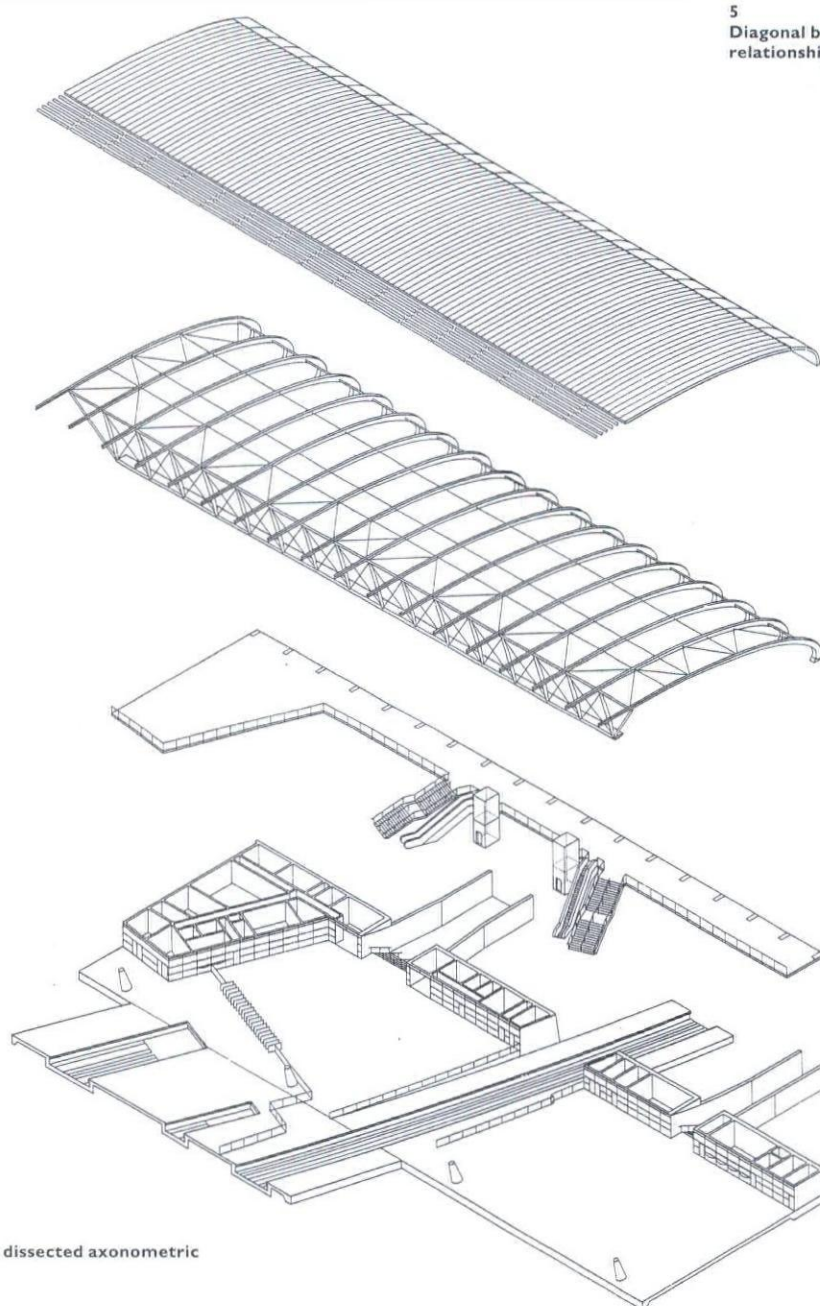




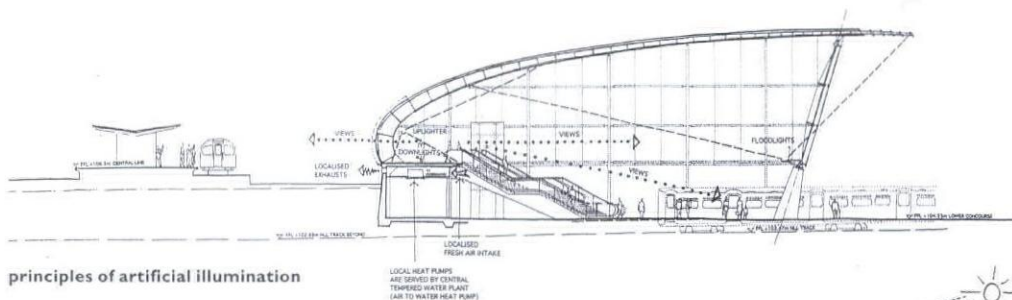
tracks had to continue in operation throughout the construction period). The western concourse also acts as the termination for the Jubilee Line platforms, which with that line's operating building, have formed a separate architectural commission (by Troughton McAslan) that relates clumsily to Wilkinson's fine pavilion. I am sure that this description of the railways and their connections is confusing: to understand fully you will have to consult the site plan. Users will of course not be able to do this, but it is extraordinary how well-organized signs work so effectively in stations: Piccadilly Circus and King's Cross for example are probably more complicated than Stratford, but even novices find their way round them.

Orientation at Stratford will be made much clearer than in underground stations by the big airy volume contained within the roof's elegant curve (which is in fact an almost perfect quarter ellipse). It starts at the back of the concrete upper level walkway against the embankment. From here spring a series of curved plate girder ribs which taper in cross-section along their length in both depth and width. Each cantilevered girder is propped towards its outer end on an inclined steel post that tapers at both ends, and these are linked by horizontal tubular members and diagonal bracing to form what is in effect a gigantic Vierendeel truss that runs along the whole south side of the building and also carries the glass. Loads from this ensemble are carried to the ground by only four massive piers positioned to avoid rail tracks and the mysterious river. The piers are designed to withstand the impact of wandering bits of train if there is a disaster on the North London Line, and the whole structure is required by railway regulations to be resistant to total collapse if one of the curved ribs were to be destroyed, or the front truss assembly damaged.

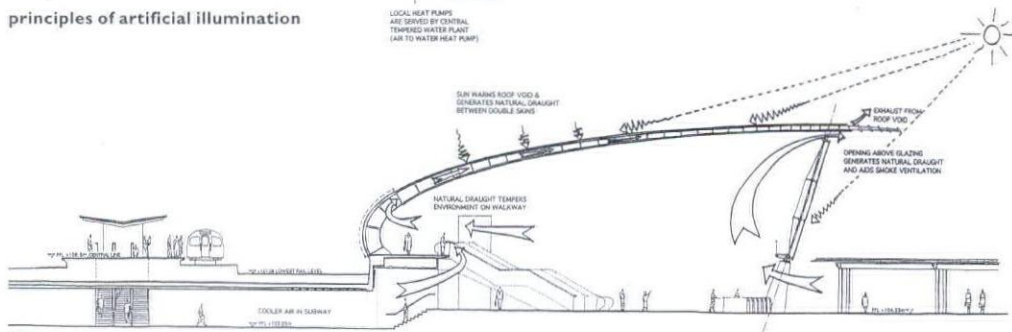
This strength is never ostentatiously displayed. Instead, the gentle high curve welcomes arrivals from the Jubilee Line and generously encloses transfers between all



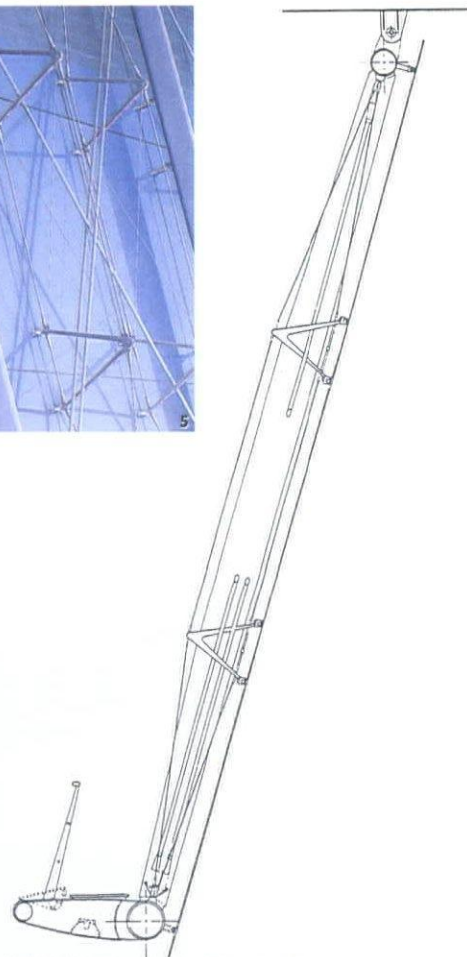
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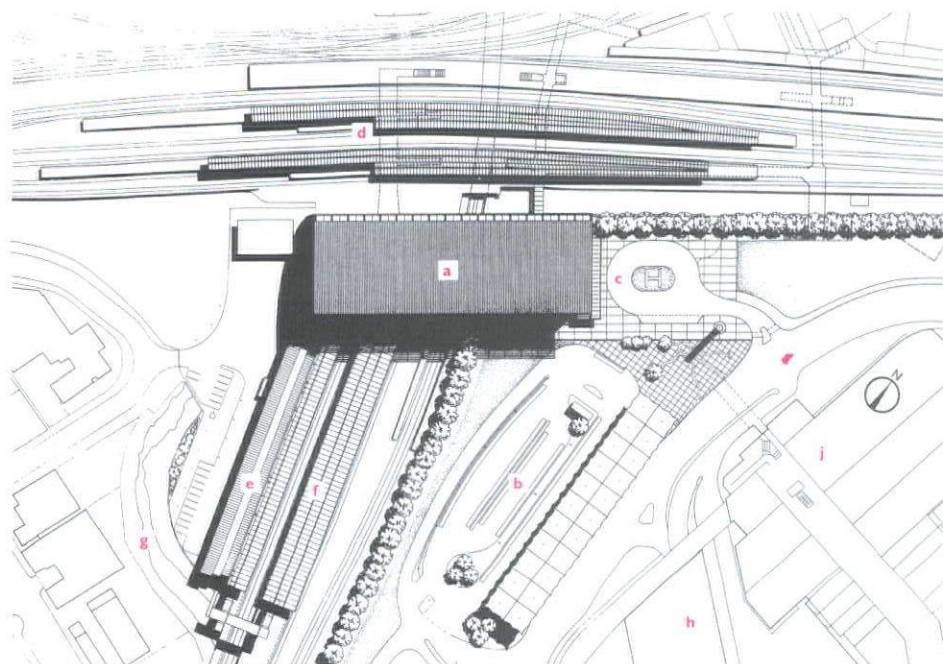
principles of artificial illumination



principles of convection cooling



detail of glass wall structure (see 5)

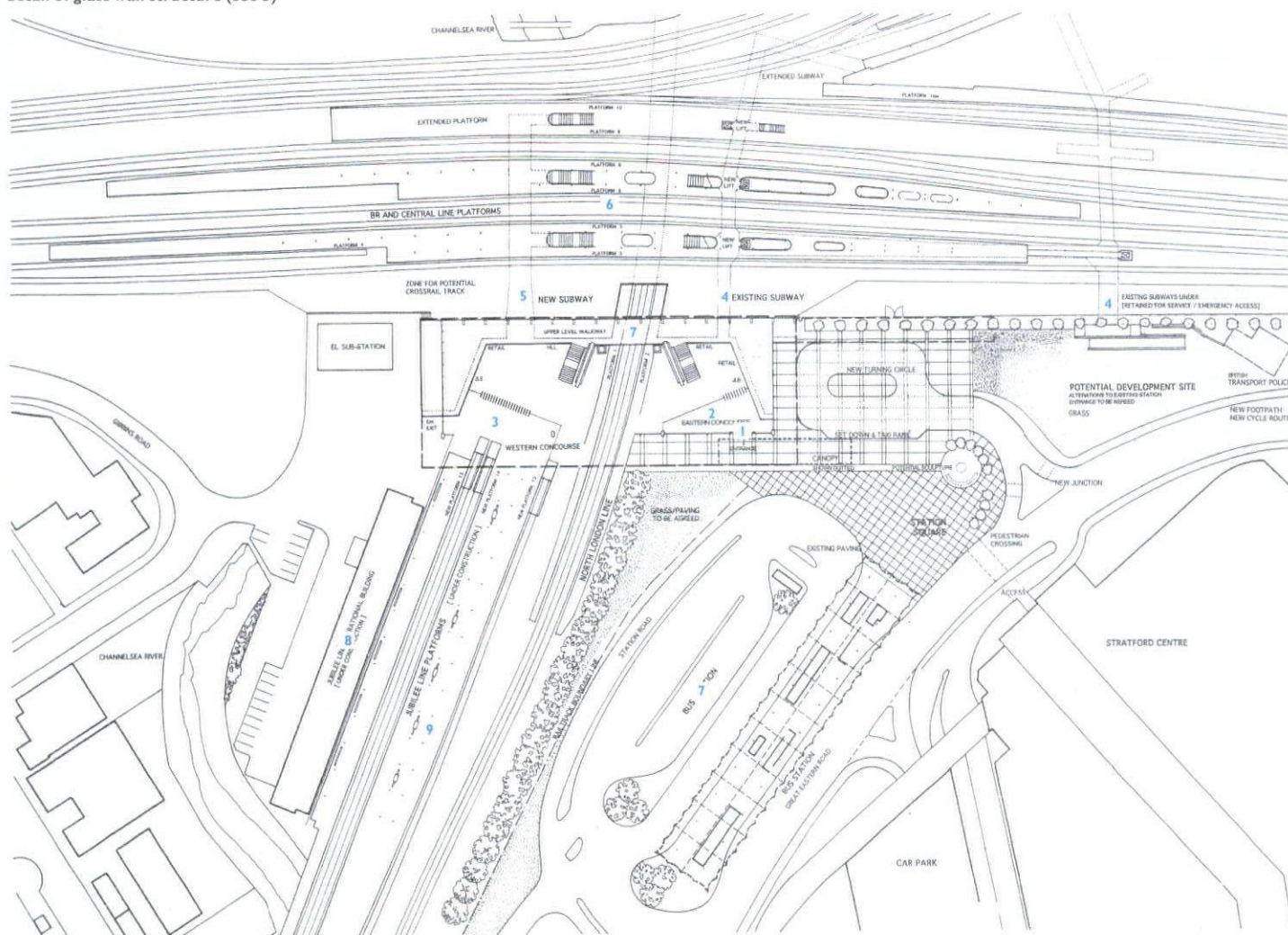


site plan

- key to ground level plan
- 1 entrance
 - 2 east concourse
 - 3 west concourse
 - 4 existing subway under embankment
 - 5 new subway
 - 6 high level platforms
 - 7 bus station
 - 8 Jubilee Line administration
 - 9 Jubilee Line platforms

key to site plan

- a new station
- b bus station
- c new turn-round
- d High level British Rail and London Underground tracks
- e JLE administration
- f JLE platforms
- g Channelsea River
- h car park
- i Stratford Centre



ground level plan (scale approx 1:1800)

STRATFORD STATION, LONDON

ARCHITECT

CHRIS WILKINSON ARCHITECTS

the different tracks. It is full of light. In daytime, light pours into the place through the great glass wall and through curved glazed cladding at the point where the roof springs from the back of the upper level walkway. Incidentally, from here you get tantalizing glimpses of the platforms at the top of the embankment, but you can't reach them because space has been allowed for yet another railway (the perhaps never-to-be-built Crossrail) between the new building and the existing tracks.

At night, floodlights on the gantry that runs along the bottom boom of the Vierendeel flood the silver ceiling with luminance, their effect aided by uplighters on the inner part of the curve, and downlighters which will illuminate the shops and café which are hoped for on this level.

I have left the most ingenious bit until last. Where the silver bit of the roof changes to glass just after the most acute part of the curve, there are grilles which admit air to the spaces between the plate-girder ribs. At the outer, thin, edge of the roof, there is another grille.

So because of its shape, the whole roof can act as a convection mechanism whereby, as the outer skin is heated by the sun, the voids between the ribs start to act as channels for natural draughts that draw relatively cool air from the subways and the outside through the big space to reduce the internal temperature. In effect, the hotter the sunshine becomes, the more efficient the process – a remarkably unostentatious and (so far – I was there on a very hot day) satisfactory example of a passively controlled internal climate, calm and without the fashionable trappings of dramatically expressed thermal chimneys or wind scoops.

It all seems so simple at first sight. But to create the clarity of the space, and allow its very complex interconnections, to make a silk purse out of a sow's ear of a site, and to relate structure and climate control in such an satisfactory way shows architectural and engineering skills of a very high order. P. D.



6 West concourse, with approach to Jubilee Line Extension platforms left.

7 Bottom boom of great south beam bears on four specially strong reinforced-concrete piers.

8 Shaded curved glazing on north side of hall brings in light and offers tantalizing glimpse of high level tracks from upper level.

9 From upper level, with North London Line train in foreground. Maintenance gallery at base of south beam acts as lamp gantry, projecting light upwards onto silver roof. Note glass lift, right.

10 Looking south from upper level with entrance to Jubilee Line platforms seen through balustrade, and spiky bus station beyond glass wall left.

Architect

Chris Wilkinson Architects: Marc Barron (project architect), Dominic Bettison, Stafford Critchlow, James Edwards, Maurice Friel, Matt Hale, Stewart McGill, James Parkin, Chris Poulton, Geoff Turner, Robert Troup, Oliver Tyler, Chris Wilkinson

Director in charge

Jim Eyre

Structural, mechanical, electrical and services engineer

Hyder Consultants

Steel castings

Goodwins Steel Castings

Structural glazing

Pilkington UK Ltd

Curved glass

Pluswall UK

Entrance doors

Dorma Entrance Systems

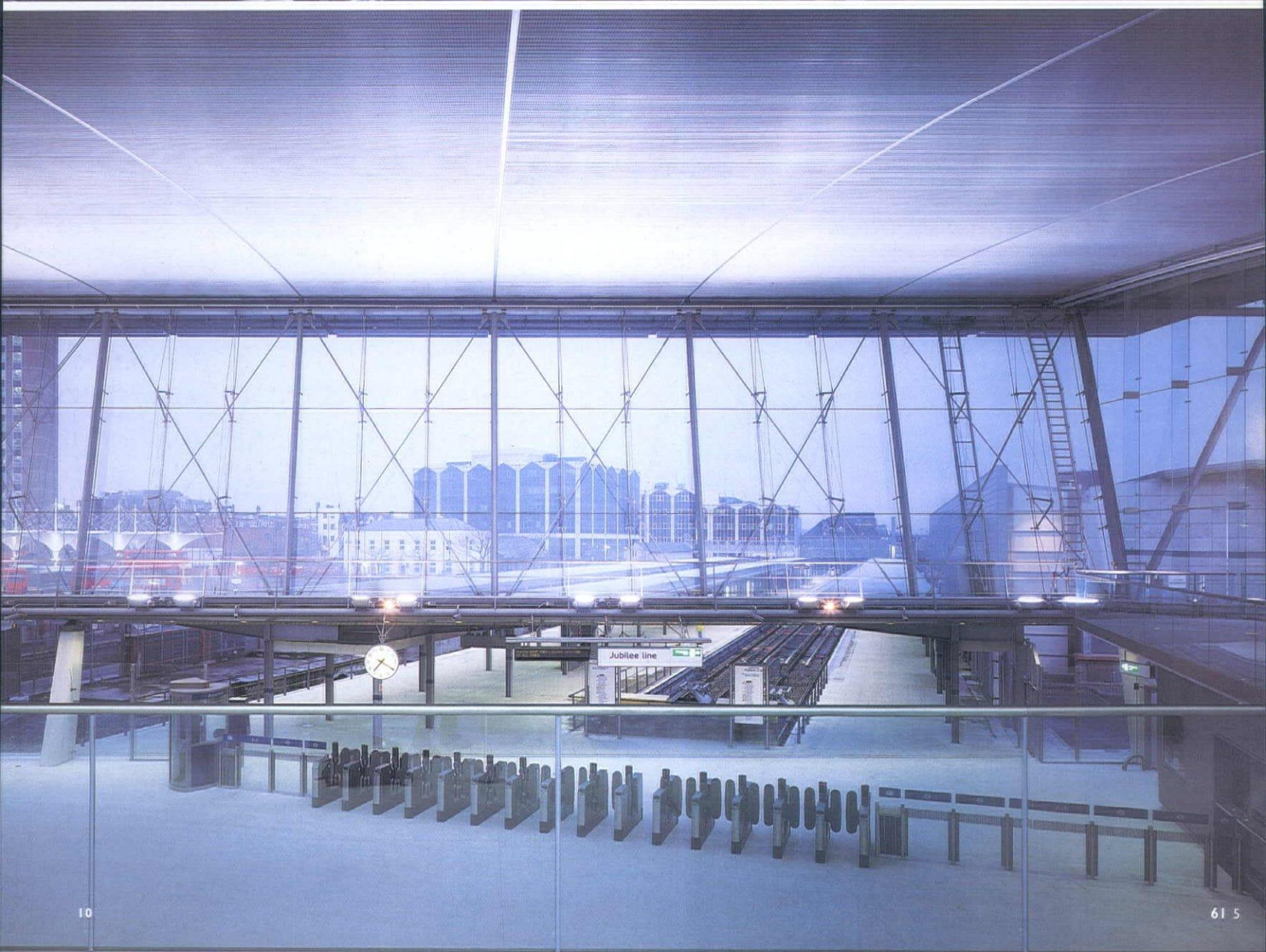
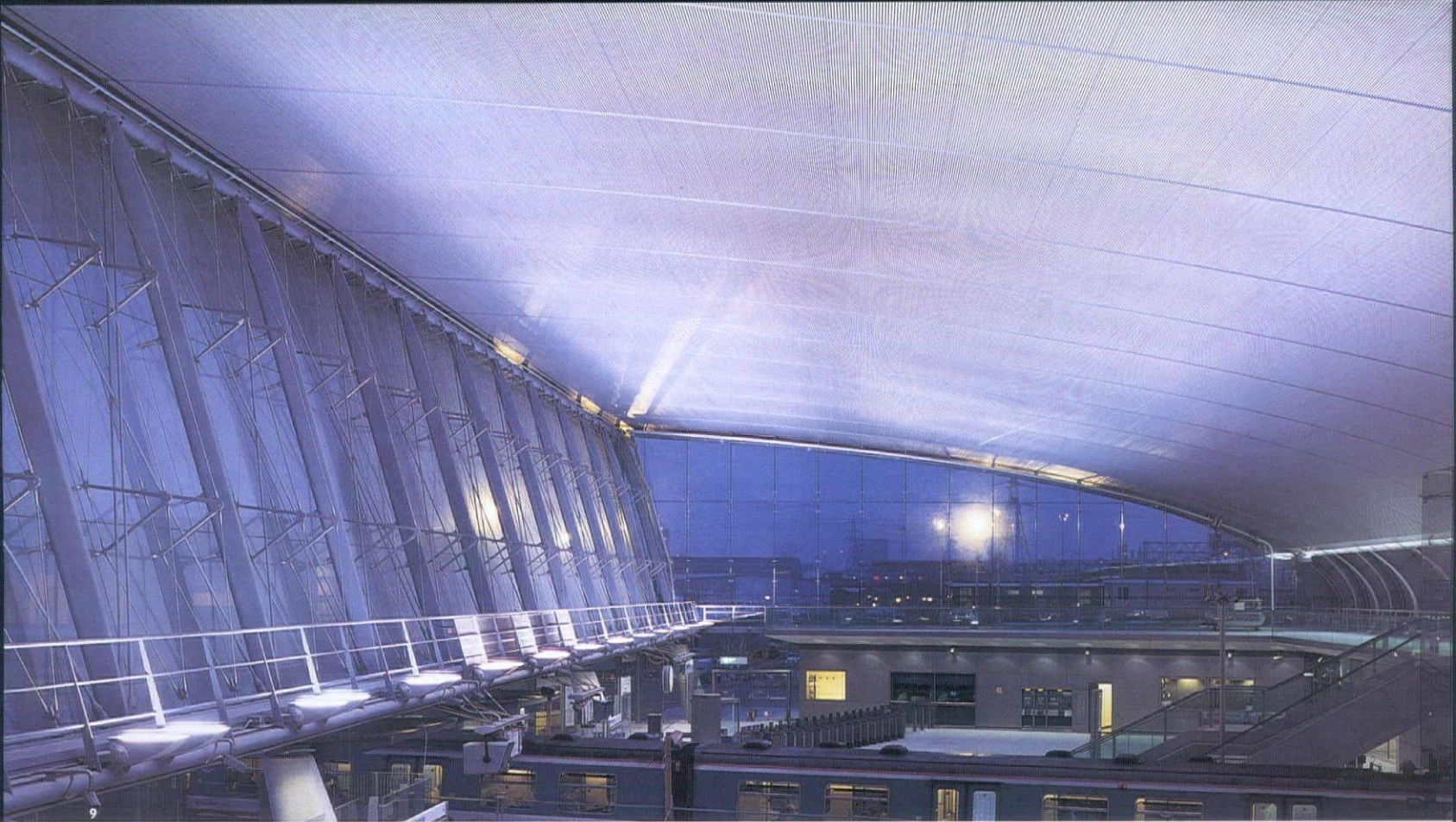
Stainless steel cladding

Baris UK

Photographs

Dennis Gilbert/VIEW





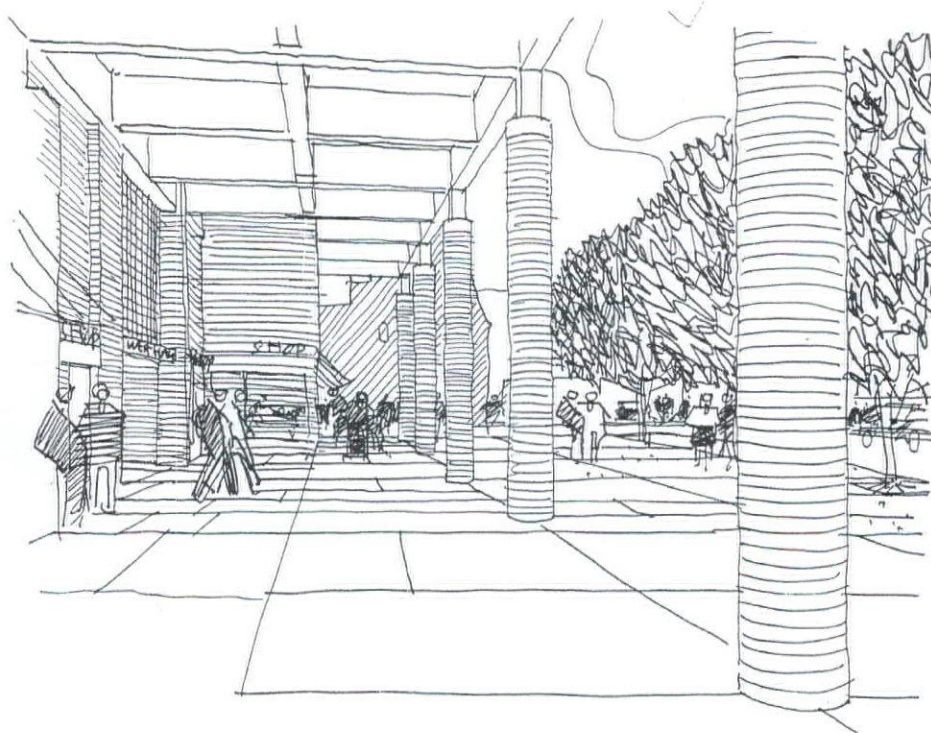


West Ham lies between Stratford (p56) and Canning Town (p65) stations and, like them, it is a very complicated above ground junction of different rail lines. Here, a London Underground (metro) line and a branch of British Rail (national network) cross the north-south tracks of the North London Line (another part of British Rail). The new Jubilee Line Extension runs parallel to that route at ground level. The new station largely replaces and updates an existing one which served all the older lines. A bridge connects the new ticket hall with the island platform for the North London Line and the entirely new one for the Jubilee Line to the west.

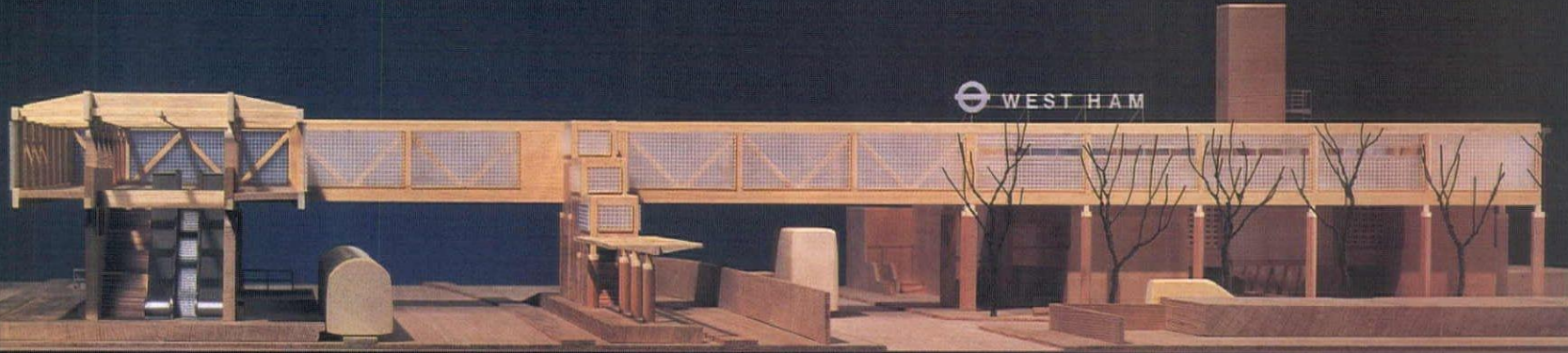
Unlike the other stations so far completed, West Ham is consciously influenced by the interwar work of Charles Holden, who built urbane Dudokian stations as neighbourhood nuclei when the metro system exploded, vastly increasing the effective size of the city. In some of his best stations, Holden created lofty halls of brick and concrete lit from tall clerestories, and that is exactly what van Heyningen & Hayward have done at West Ham. A rigorous 6m x 6m structural and servicing grid disciplines the whole design. In-situ concrete columns at the nodes of the grid are clad in brick, and formed to be either round in section (when they are free-standing) or square, where they engage with walls as pilasters or grow out of them. The columns support precast roof members which trace the grid in the ceiling, itself made

WEST HAM SANDWICH

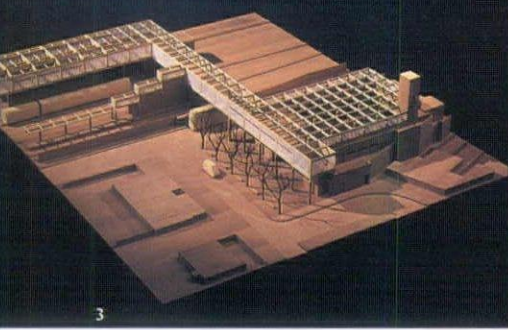
This station, unlike its fellows on the Jubilee Line Extension, uses the strategy of linking platforms by a bridge, rather than tunnels. And because of its exposed position, it adopts a different aesthetic, derived from the decent, urbane London Underground architecture of the interwar years.



entrance portico-arcade

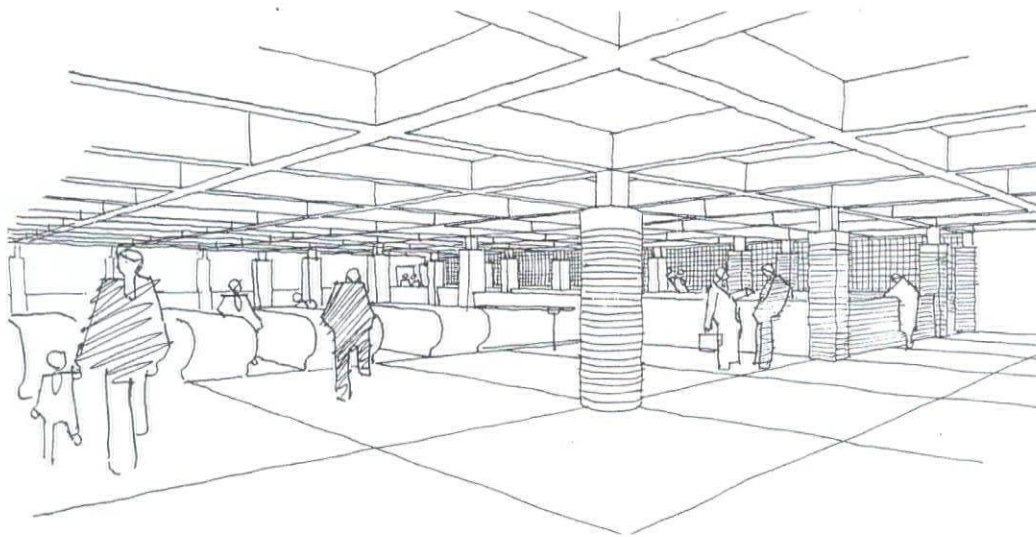


2



3

WEST HAM STATION, LONDON
 ARCHITECT
VAN HEYNINGEN AND HAWARD
 ARCHITECTS

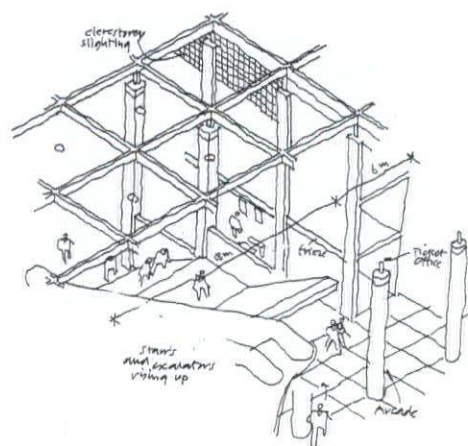


- 1 South elevation of new station showing paved forecourt and portico-arcade formed by bridge overhead.
- 2 Extended south view of model with concourse over new platforms (left) in section.
- 3 From south-east. Upper level tracks are on embankment to north (right) and not shown here.
- 4 Grand bank of stairs and escalators from hall to bridge. Daylighting by glass brick clerestories.

going down to ticket hall from bridge

WEST HAM STATION, LONDON

ARCHITECT

**VAN HEYNINGEN AND HAWARD
ARCHITECTS**

principles of 6m grid structure

of wood wool slabs. In the hall, a bank of stairs and escalators majestically leads up to bridge level, and the space is made luminous by glass-block clerestories. Glass blocks form the walls of the bridge, and those of the upper level concourse over the Jubilee Line platform.

The main entrance is from the south, where a formal paved forecourt will be partly turned into a welcoming arcade by the bridge overhead. Passengers will either go northwards through both the new hall and the old one to the stairs leading to the overhead lines, or if they want to get to the north-south platforms, they reach the old hall and then have to turn round to go up the stairs to the bridge. The apparently clumsy route was necessitated by the very tight and complicated site.

So far, the project looks promising. But much will depend on final execution. The architects say that because the consultants were not allowed to supervise work on site, 'it was part of our approach that the aesthetic should be tough enough to survive the rigours of a protracted construction period, variable quality control and changing legal and technical requirements'. We shall shortly see if their strategy has worked.

Architect

van Heyningen and Haward Architects

Design team

Birkin Haward, Joanna van Heyningen, Robin Mallalieu, Lucy Marston, Bert Rozeman, Peter Williams

Technical contractor and structural engineer

Kenchington Ford

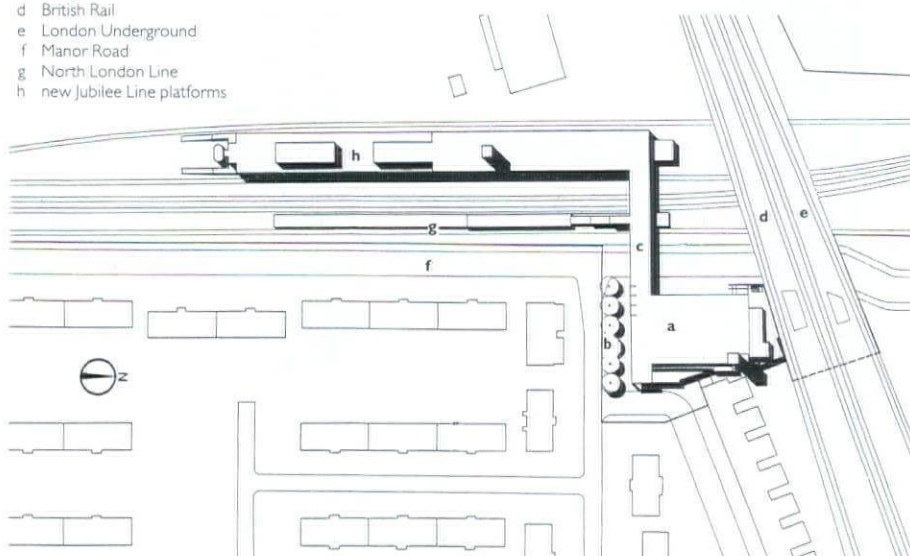
Electrical and mechanical engineer

Jubilee Line

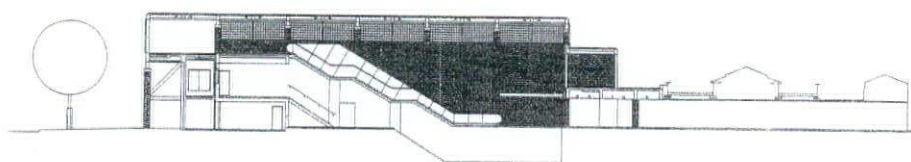
Model photographs

Putler/Armiger

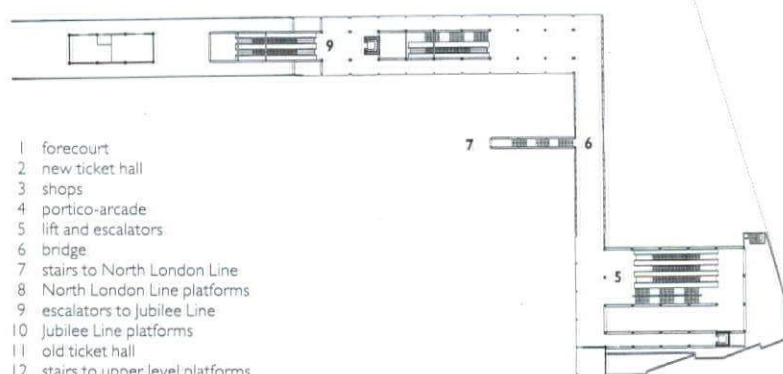
- a new ticket hall
- b forecourt
- c bridge
- d British Rail
- e London Underground
- f Manor Road
- g North London Line
- h new Jubilee Line platforms



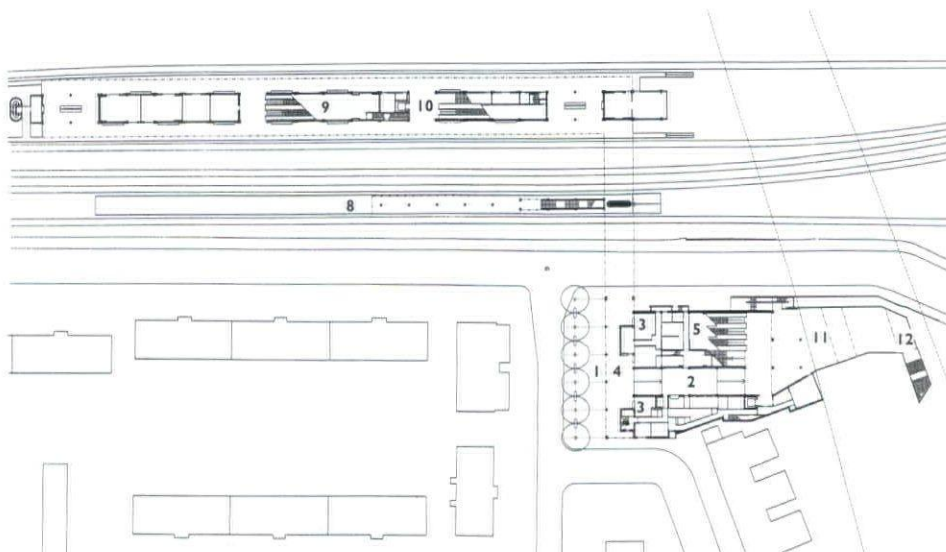
site plan



section through stairs to bridge



bridge level



ground level (scale approx 1:1700)

CANNING STACK

CANNING TOWN STATION, LONDON

ARCHITECT

JOHN MCASLAN & PARTNERS

(FORMERLY TROUGHTON MCASLAN)



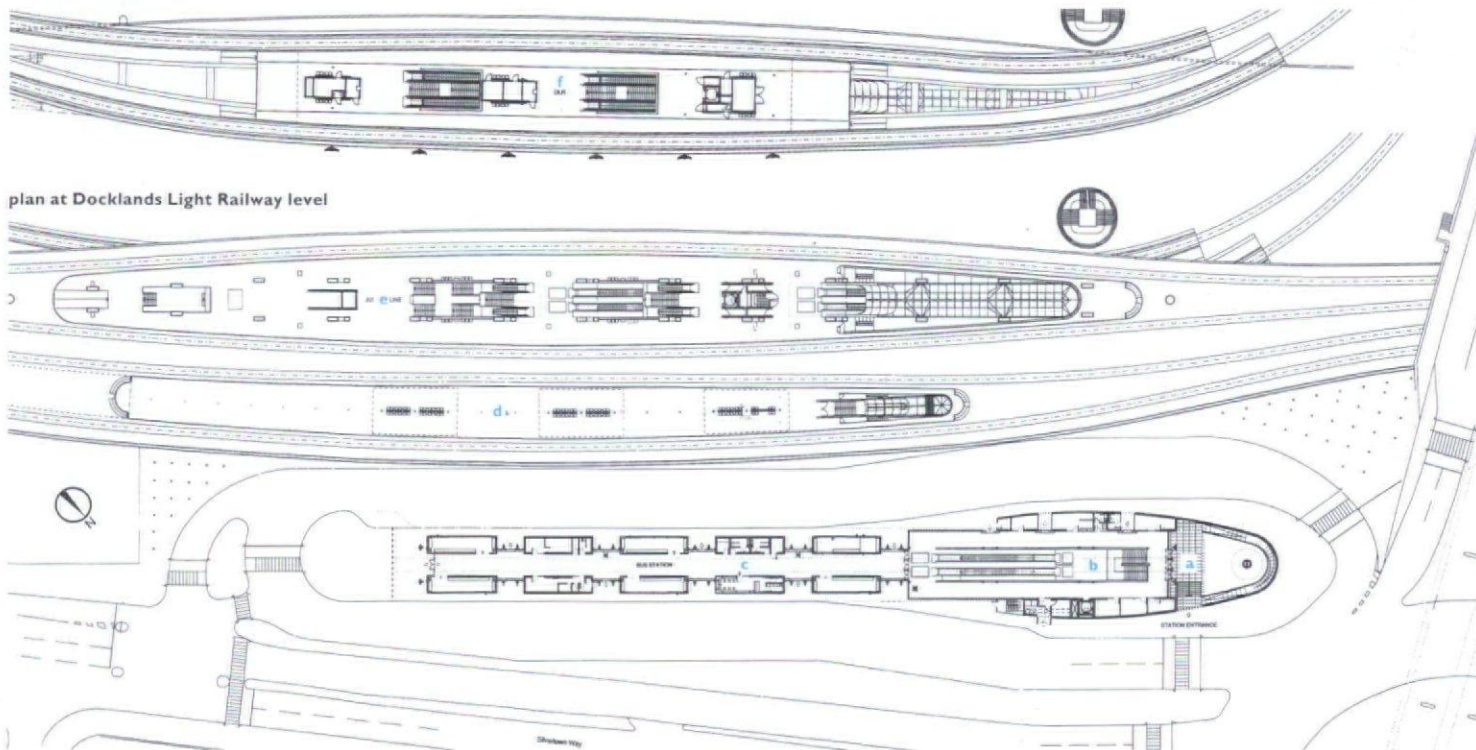
Stacked stations at Canning Town ingeniously interlock with an existing transport pattern to give possibilities of urban regeneration.

Like Stratford (p56) and West Ham (p62), Canning Town is a very complicated interchange. Five transport systems are woven together there: the Jubilee Line Extension (JLE), the Docklands Light Railway (DLR), the British Rail (national network) North London Line, City Airport* buses, and the general London Transport bus service. As well as having to link all these, the project was made more complicated by very restricted site conditions, between a major city road and the tidal inlet of Bow Creek. Above are the 400kV transmission lines of one of the capital's major power arteries.

Site constrictions dictated that the Toytown DLR should be placed over the JLE, with British Rail on parallel tracks to the JLE at ground level. Parallel to the railways is the bus station, which also acts as the entrance to the whole affair. Passengers come in from the street and either walk along to the bus station or descend to the subway that leads to the railway ticket hall by stairs, escalators or lift. An underground concourse links the ticket hall with escalators and lifts serving

* The City Airport is the innermost of London's five. It offers short journeys to the Continent.

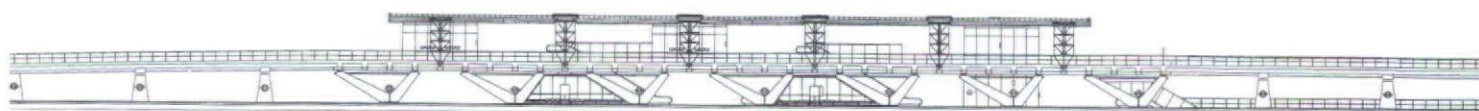
1 British Rail island platform in foreground with, behind, DLR station over Jubilee Line.
2 Descent from entrance hall to underground concourse that connects to platforms.



plan at Docklands Light Railway level

ground level plan (scale approx 1:2300)

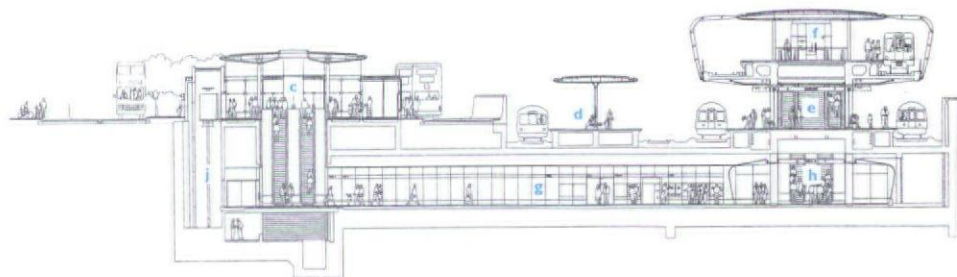
- | | |
|--------------------------|-----------------------------|
| a entrance | f DLR platforms |
| b entry hall | g subway |
| c bus station | h concourse and ticket hall |
| d British Rail platforms | j hydraulic lift |
| e Jubilee Line platforms | |



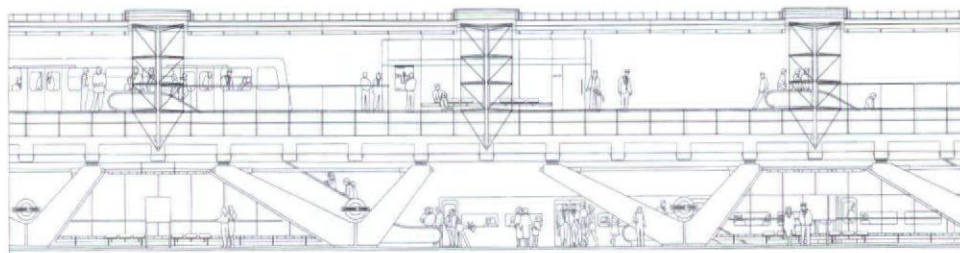
Docklands Light Railway rises up to platform over Jubilee Line station

the platforms above. The ticket hall and the concourse are toplit from rooflights made of large glass sheets hung from cast stainless-steel brackets which extend from central spine beams. So dramatic views are offered up through the roof of the ticket hall to the sky through the DLR viaduct overhead – another instance of Paoletti's insistence that light should be brought down into lowest levels.

The DLR is supported on Y-shaped precast concrete struts on the JLE platform. They prop a deck made of post-tensioned elements. This glued segmental construction allowed the structure to be assembled without the need for large cranes, which would have become tangled up with the overhead power lines. All the various platforms are visually related by canopies and roofs: a family of aerofoils. Glass and aluminium finishes throughout further unite a very diverse complex.



cross section through whole complex (see key above)



detailed elevation of Jubilee Line station under DLR

Architect

John McAslan & Partners (formerly Troughton McAslan)

Engineer

WSP

Quantity surveyor

EC Harris

Photographs

Dennis Gilbert/VIEW

3
Ascent to the new Jubilee Line platform from underground concourse. Daylight brought to lowest level between viaduct tracks of DLR at top level.

CANNING TOWN STATION, LONDON

ARCHITECT

JOHN MCASLAN & PARTNERS

(FORMERLY TROUGHTON MCASLAN)



UNDERGROUND STATION,
NORTH GREENWICH, LONDON

ARCHITECT

ALSOP & STÖRMER

PREVIOUSLY ALSOP LYALL & STÖRMER

DEEP BLUE

North Greenwich is the station for the vaunted Millennium Dome, and is the only underground one shown in detail in this issue. An awesome blue cave has been created as a spectacular celebration of arrival and departure.

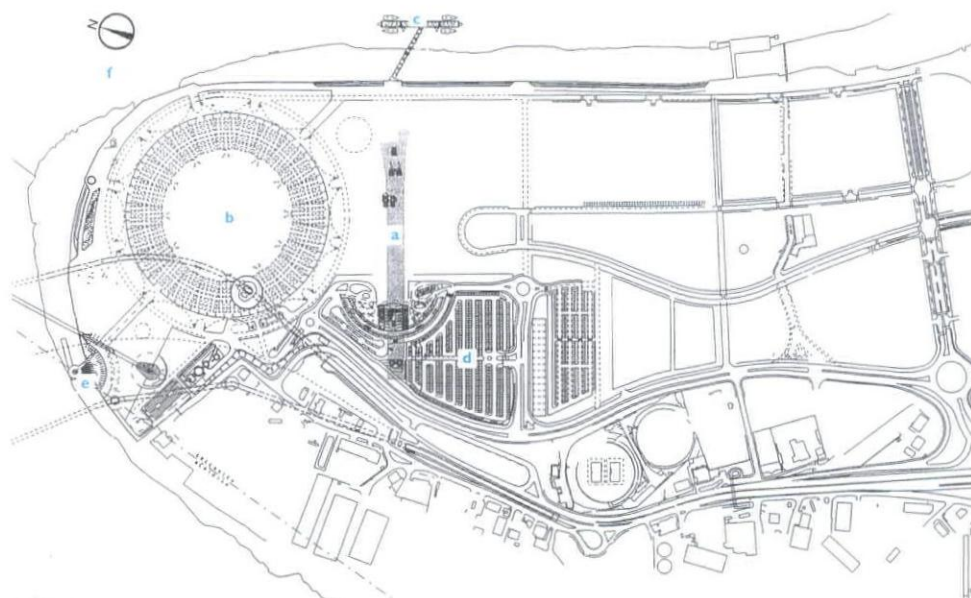


Formerly a bleak, remote and polluted tract of land, North Greenwich peninsula is being energetically transformed as the site of Rogers' ubiquitous Dome (AR February 1998) and Millennium Village, a mixed development masterplanned by Ralph Erskine. Beyond the millennial machinations, the Jubilee Line Extension (JLE) will connect the peninsula with central and east London, bringing radical and greatly needed improvements to the area's transport infrastructure. (Above ground, the new station is linked to an elegant, airy bus terminus, designed by Foster and Partners.) But the presence of the Dome and its predicted torrent of visitors means that North Greenwich is more than simply a local station in an obscure part of London; instead it forms a public gateway to the revitalized peninsula.

The only station on the JLE to be built on a completely clear site, North Greenwich is a

subterranean set piece theatrically orchestrated by Alsop Lyall & Störmer. The initial design was based on the notion of an open station that allowed passengers to enter the ticket hall along a central landscaped walkway, suspended on reinforced cross beams spanning the station void. A cut and cover solution was finally adopted, so that the entire station is now underground, but the choreography of changing levels, soaring voids and exposed vertical circulation give the scheme a dizzying, Piranesian quality underpinned by some muscular civil engineering. The station is contained within a cofferdam 400m long, 30m wide and 25m deep. (The excavated hole was large enough to accommodate Canary Wharf Tower laid on its side.) The station structure itself is a large concrete box, 380m long, 22m wide and 22m high. As there are no intermediate floors within the central public area of the box to carry lateral

- 1 Escalators descending to booking hall level.
- 2 The splayed columns rise from platforms ...
- 3 ... to emerge through the floor of the ticket hall, which leads ...
- 4 ... to the concourse that flies through the Piranesian cave.



- a underground station
- b Dome
- c pier
- d Dome car park
- e Greenwich Meridian monument
- f River Thames

site plan



3



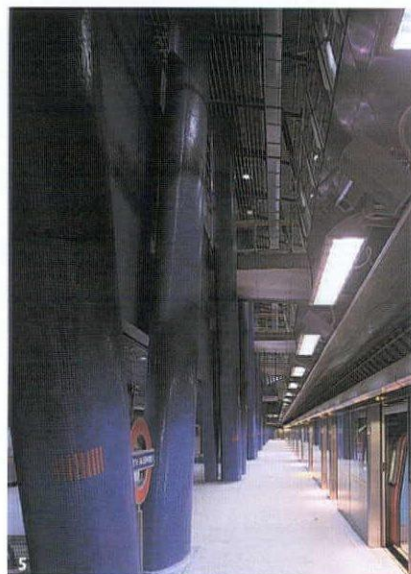
4

UNDERGROUND STATION, NORTH GREENWICH, LONDON

ARCHITECT

ALSOP & STÖRMER

PREVIOUSLY ALSOP LYALL & STÖRMER



loads, two rows of raking, aerofoil-shaped concrete columns 13m high act like trusses, supporting the roof slab above. Hanging concourses and banks of escalators and stairs reveal the imposing presence of the structure.

The ticket office is located on an upper level toward the west end of the station. From here, passengers move to a concourse suspended from the concrete roof structure. Voids on either side of the concourse enclosed by glass panels offer views of the platforms below, inducing a sense of openness and transparency rarely experienced in London's cramped and dingy tube network.

The heroic scale and simple elegance of the civil engineering structure are reinforced by vigorous use of colour. Walls, floors and ceilings are coloured a seamless, intense blue. Cobalt mosaic tiles and glass combine to give a sumptuous, otherworldly dimension to the cavernous space. Suspended in the ultramarine void, a network of gleaming

stainless-steel ducts and escalators adds to the visual richness and complexity. Cobalt blue has become something of an Alsop signature – the scaly ultramarine tiles and organic structure of the government headquarters in Marseilles (the 'Big Blue', AR October 1994) have a similarly surprising yet seductive resonance. At North Greenwich, the painterly intensity of the gorgeous blue void elevates the mundane, people-processing business of shuffling to and from underground platforms into a mesmerizing journey through a magical interior realm.

CATHERINE SLESSOR

Architect

Alsop & Störmer, London, previously Alsop Lyall & Störmer

Design team

W. Alsop, C. Egret, P. Angrave, J. Smith

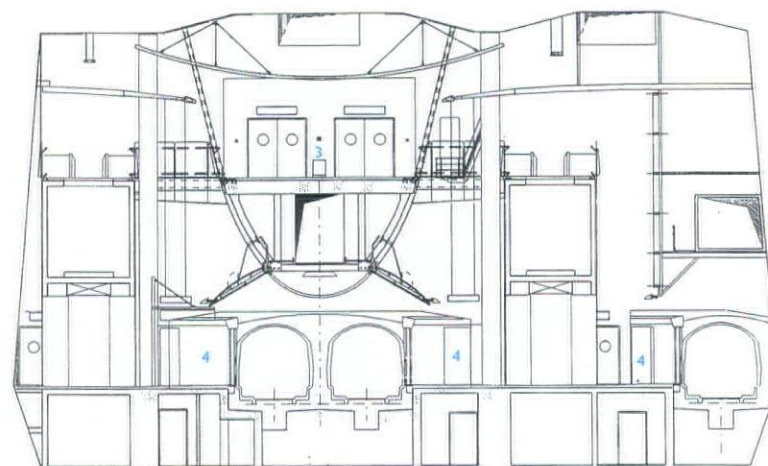
Civil and structural engineer

Benaim Works

Photographs

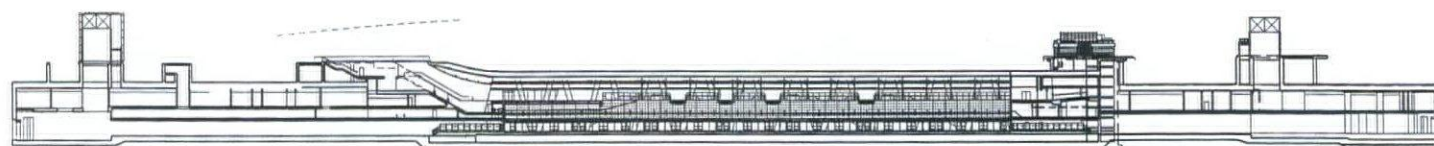
Dennis Gilbert/VIEW

5,6
Platform level with concourse over. Glass screens incorporating automatic doors shield tracks.

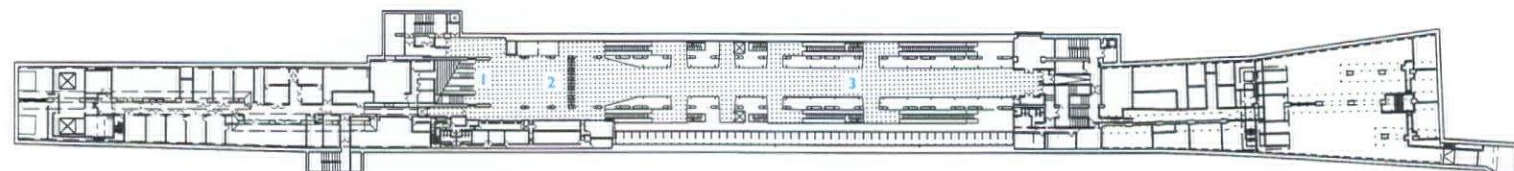


north-south cross section showing tracks and overhead concourse

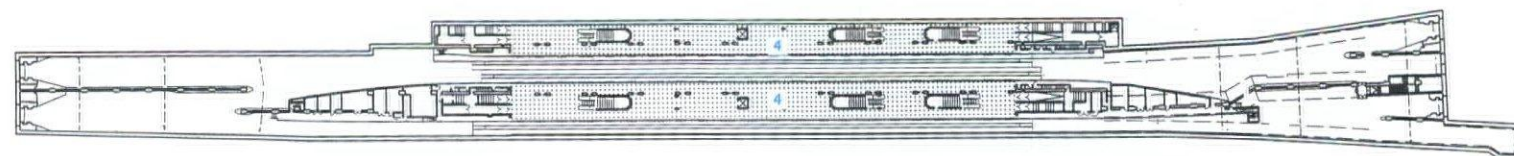
- 1 escalators to ground level
- 2 ticket hall
- 3 concourse with lifts and escalators to platforms
- 4 platforms



west-east section



plan at ticket hall and concourse level



5 plan at platform level (scale approx 1:2000)



NORTH GREENWICH

UNDERGROUND

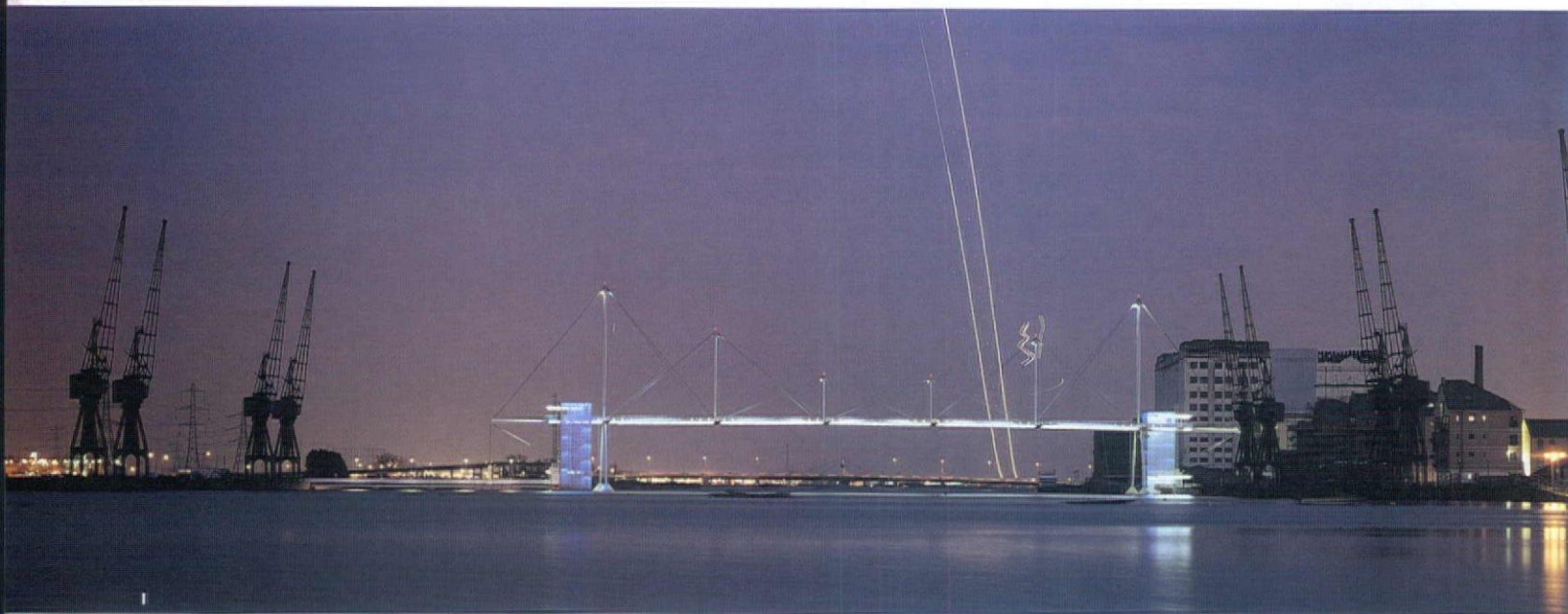
FOOTBRIDGE, LONDON

ARCHITECT

LIFSCHUTZ DAVIDSON

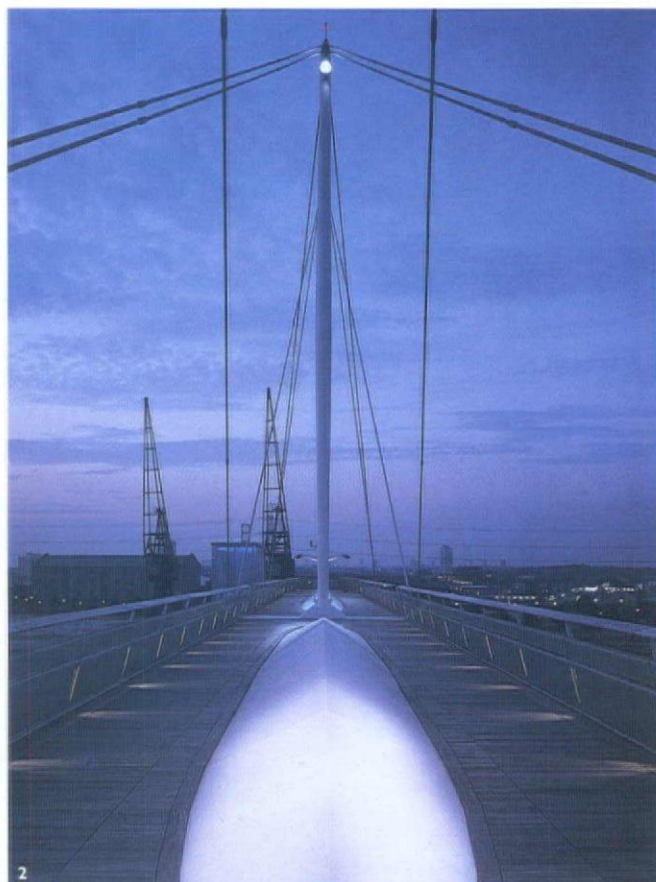
TRANSPORTER OF DELIGHT

This footbridge in London's Docklands explores nautical forms and materials to create a striking new landmark.



Dating back to the era of robust and inventive Victorian engineering, the transporter bridge is not a new idea. The notion of ferrying people and vehicles across water in a moving platform or gondola slung from a gantry-like structure was first proposed by an English engineer Charles Smith in 1873 and later evolved by his French counterpart Ferdinand Arnodin in the early twentieth century. Adopted for deep water crossings, where the frequent passage of shipping might compromise a conventional opening bridge, transporter bridges are a dominant feature of industrial port skylines from Middlesbrough to Bilbao.

For this new footbridge in London's Docklands, Lifschutz Davidson (working with structural engineer Techniker) reinterpret the principles of the transporter bridge to create an elegant, lightweight structure that has become a new landmark for the area. Spanning Royal Victoria Dock in the bleak and still relatively ungentrified eastern fringe of Docklands (near the small City airport), the new bridge was the outcome of a competition held in 1996. The vast basin of Royal Victoria Dock is currently being converted into a regional sailing centre and the competition brief called for a new enclosed footbridge with appropriate clearance for sailing craft and a low profile to reduce wind turbulence. Taken literally, this suggested an uninspiring tube-like structure, sealing pedestrians off from the outside world, so Lifschutz Davidson proposed the alternative of an open bridge with an enclosed gondola slung beneath it. Due for installation in the second phase of the bridge's development, the glazed cabin (which can hold up to 40 people) will be hung from the underside of the bridge deck structure. An adjustable suspension cable mechanism enables the gondola to be raised from the quayside





1
The new bridge spans the basin of the Royal Victoria Dock. At night, it forms a glowing, festive landmark in the dock landscape. Comet-like light trails from aircraft using the nearby City airport add to the spectacle.

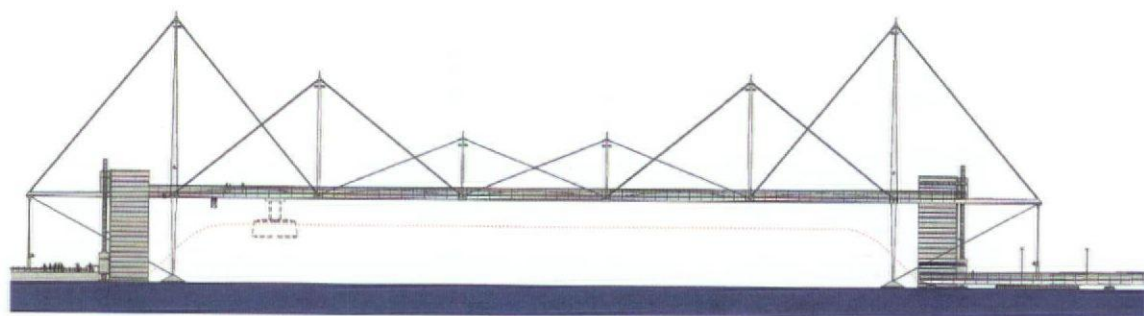
2
Elevated above the dock, the open bridge deck provides dizzying views of the docks.

3
The elegant yet robust structure of steel masts and cables is inspired by the maritime context. The high clearance permits the passage of sailing craft in the dock below. A glass gondola suspended from the bridge deck will eventually ferry people across the dock.

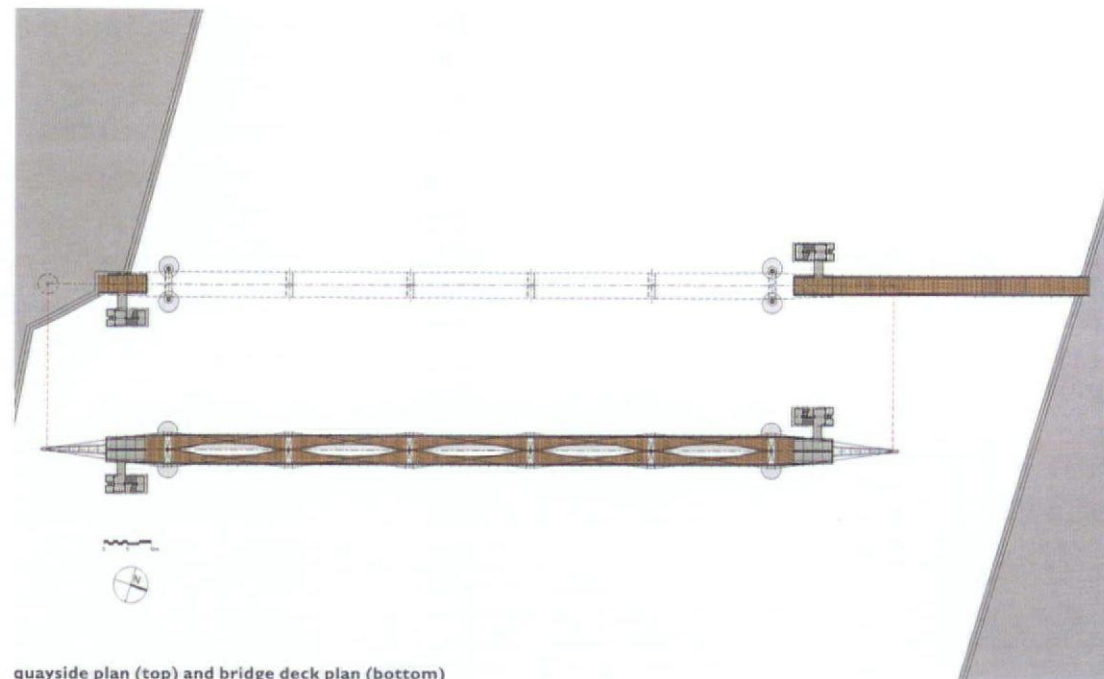
FOOTBRIDGE, LONDON

ARCHITECT

LIFSCHUTZ DAVIDSON



east elevation



quayside plan (top) and bridge deck plan (bottom)

Architect

Lifschutz Davidson, London

Structural engineer

Techniker

Mechanical and electrical engineer

Allott & Lomax

Cost consultant

Davis Langdon & Everest

Fire engineer

FISEC

Lighting consultant

Equation

Photographs

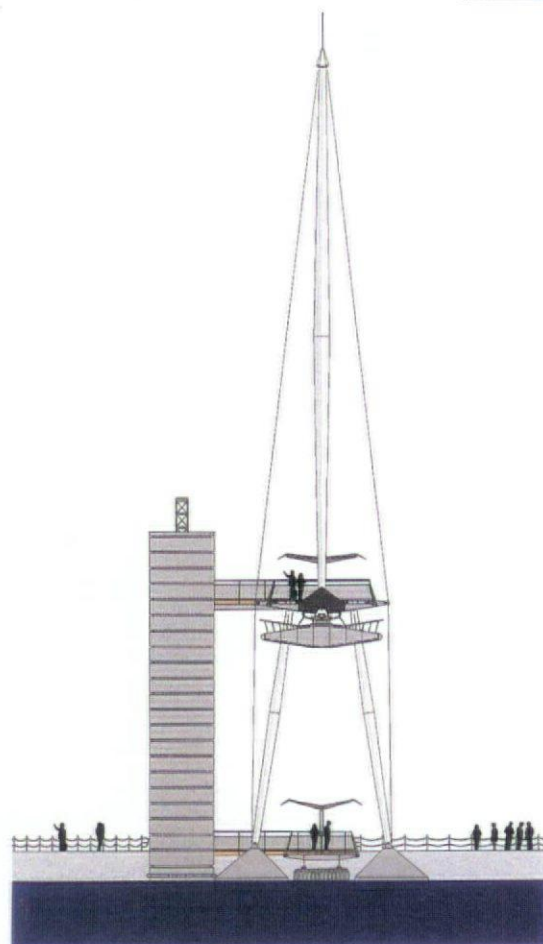
1, 3 Chris Gascoigne

2 Marcus Robinson

landing stations to deck level and propelled over the dock like a monorail. Alternatively, it can skim lightly across just above the water when there are no boats in the vicinity.

The broad promenade of the pedestrian bridge gives spectacular views over the docks, but as it is uncovered, its use will depend to some extent on the clemency of the weather. Embodying a tough aerodynamic spirit, the tall masted structure of the bridge deck is inspired by the dock landscape of gaunt cranes, masts and cables. Poised 15m above the water, the bridge structure takes the form of a steel Fink truss spanning 130m and supported at each end by a pair of trestles. Five box girder beams make up the Fink truss. This particular structural form was selected for its capacity to combine lightness of construction with very long spans. Six tapering conical steel masts of varying lengths are linked by cables to tie-down points along the length of the deck. At each end of the bridge, another cable carries tension forces to the ground through an angular bowsprit adding to the dynamism of the overall composition.

Materials have a functional, maritime rigour – the steel structure is partnered with a hardwood deck and handrails, and perforated stainless-steel cladding panels enclose the stair and lift towers. At night, the bridge is magically illuminated, emphasizing the sleek profile of the structure. Downlighters pick out the tall cable masts while concealed fittings on the balustrades and soffits diffuse shafts of light through the timber decking to illuminate the skeletal whalebone structure of the box beam. Over the years, Lifschutz Davidson have developed an admirable record of decent, modern buildings that both respect and revive their surroundings (for example the remodelling of the Oxo Tower, AR February 1997). This latest project adds to their reputation. CATHERINE SLESSOR



cross section

HONG KONG STATION, CENTRAL, HONG KONG

ARCHITECT

ARUP ASSOCIATES WITH ROCCO DESIGN PARTNERS

Light, airy volume of the In-Town Check-In (ITCI) acts as booking hall for the Airport Express and main entrance. Upper levels lock into city's high-level pedestrian walkway system and offer shopping on several floors.

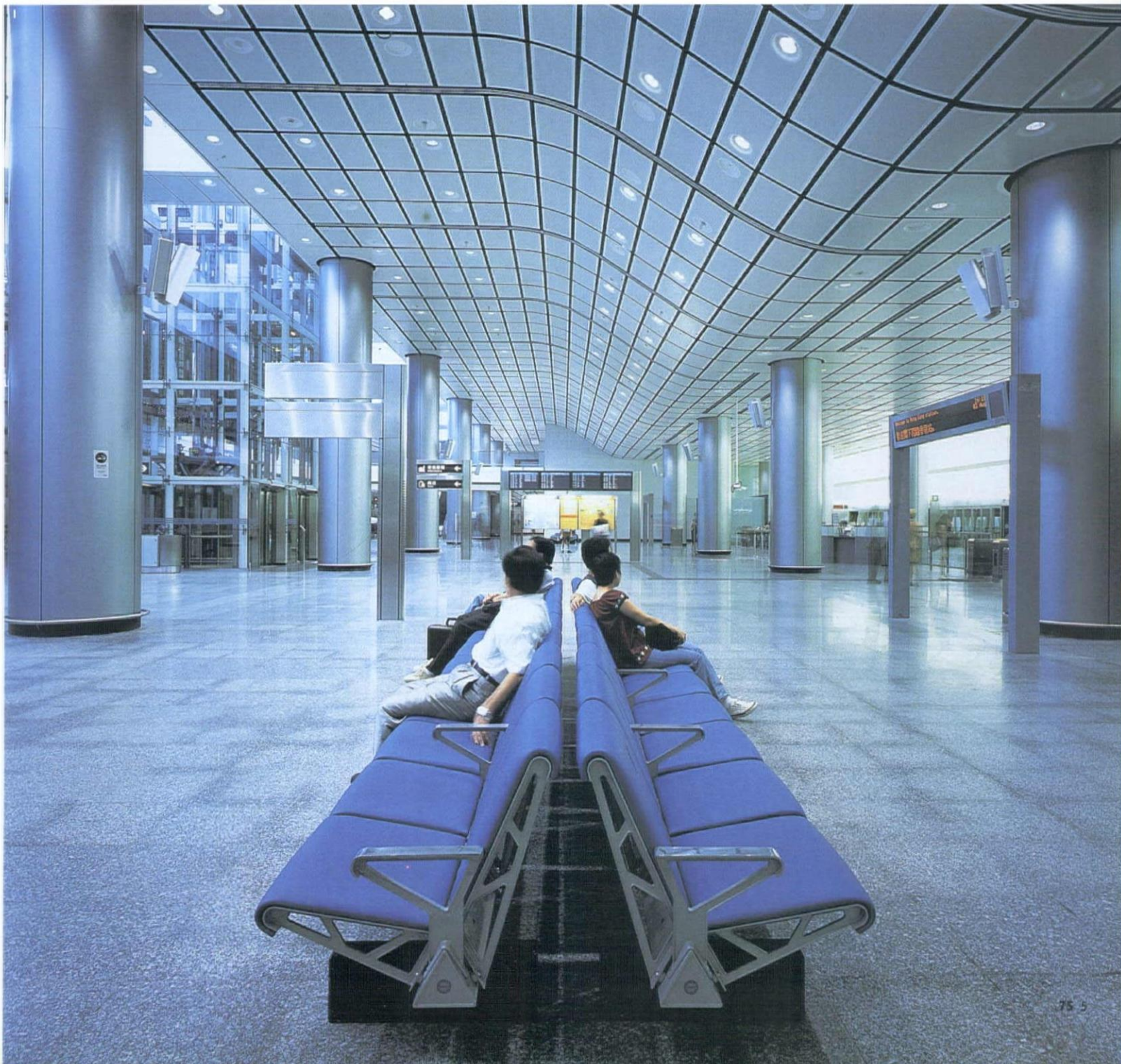
Hong Kong's underground railway is one of the most efficient in the world. It can, though, be soulless. A new station in the CBD gives the line to Chek Lap Kok airport a fitting sense of departure and arrival.

STATION MASTERY

Hong Kong Station, designed by Arup Associates in association with Rocco Design Partners in Hong Kong, is at the heart of a huge new transport interchange on the island, handling the thousands of commuters and visitors who arrive each day. The station is the terminus of the Airport Express, the fast rail link that whisks efficiently and cleanly between Hong Kong island and Chek Lap Kok; it is also the terminus of the commuter line to Tung Chung New Town on Lantau island, close to the airport. Ferry piers to outlying islands have been

rebuilt to the north of the station, and nearby are the landing stages of the famous Star Ferries which ply so romantically across the harbour between island and the Kowloon peninsula. New bus termini have been added and drop-off points for private vehicles established. Pedestrians bound for the city can leave by elevated walkway; those for the old Central station and Island Line can walk along a new subway.

Hong Kong Island and the mainland are gradually growing closer together as developers reclaim more and more land



HONG KONG STATION, CENTRAL, HONG KONG
 ARCHITECT
ARUP ASSOCIATES WITH ROCCO DESIGN PARTNERS

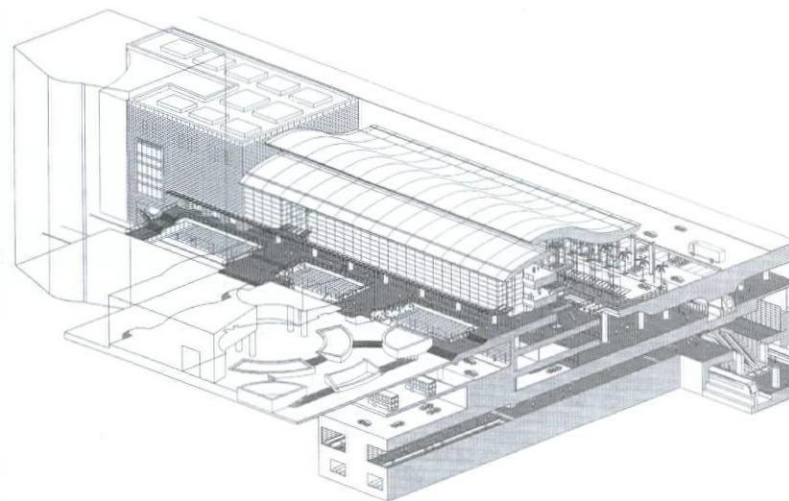
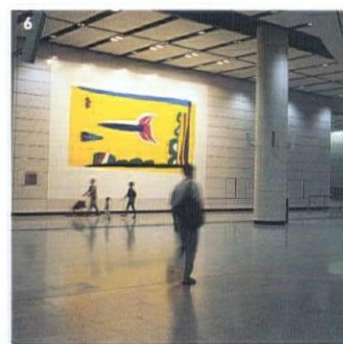
2,3
 Glass wall of ITCI floods space with light, some of which is ...
 4
 ... deflected down to AEL platform level through large voids inside the glass.
 5
 Customer service centre, neatly honed in glass and metal.
 6
 As elsewhere in system, advertising is almost non-existent, but spaces are enlivened by artworks.



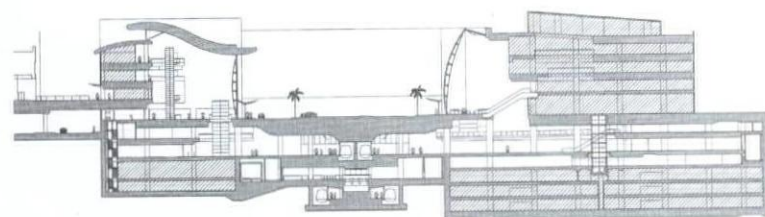
from the harbour (to the great distress of those Hong Kong-ites who regard losing any more of the historic division as a tragedy). Four hectares of such land provide the rectangular station site, to the west of Star Ferries and the General Post Office, north of Exchange Square. The station building itself – the only one of the new stations in an old commercial district – is being built in two phases and is the first stage of a larger development planned to include hotels, shops and office towers.

Designed in accordance with the client's guidelines applying to

design of all the new stations, the scheme expresses both architectural and functional clarity. In general, a coherent structural order was established for all steel elements forming the roof trusses, glazing systems, canopies and footbridges throughout the building. Design of elements such as signage, telephone kiosks, lighting and furniture is consistent throughout the various stations, as is the use of materials. Platforms are rendered quiet and energy efficient by transparent screens designed by Foster Asia.



dissected axonometric



cross section of complete scheme, with stage II (hotels and retail, on right – north)

The first phase of Hong Kong Station, completed last June, provides five main levels, four of them underground and containing two stations, one above the other, each served by a concourse. The lower station is for the Tung Chung line; the upper one, the airport express (AEL). Above it, at ground floor level, an immensely light airy volume rises four storeys high with mezzanine galleries on three levels lining the inner side. This is the clumsily named In-Town Check-In (ITCI), the booking/check-in hall for the airport express and main

entrance to the building.

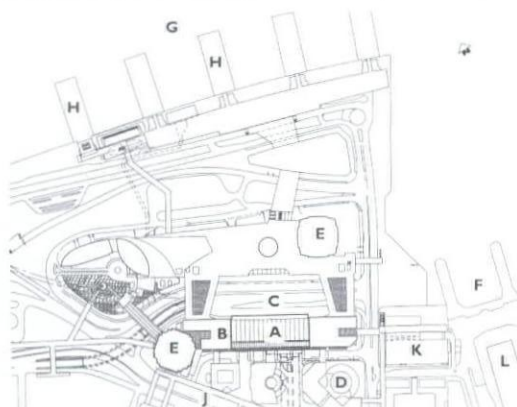
This great space, floored in granite, is surmounted by a curvilinear titanium roof on a 12m column grid and enclosed along its seaward north side by a wall of glass rising the full height of the building and supported by steel bowstring trusses. Spanning the length of a city block, the soaring articulated structure with its immense transparent face is visually weighed down on east and west by solid granite-clad bookends. Responding architecturally to the massive podium of Exchange Square,

they house stairs, lifts and shopping units. Consumerism is an integral part of travel these days, but Hong Kong being one of the world's great trading meccas, consumers at Hong Kong Station are well looked after. The three levels of mezzanine galleries provide restaurants and more shops, reached by the glass lifts that shoot up and down through the whole building, and there are plans to build glazed retail decks between the station and future developments to the north.

At present only one platform of the AEL station is in

operation, but after completion of the second phase of work, there will be separate platforms for arriving and departing passengers, each connected to car parks and taxis.

To bring light down into the AEL station, and relieve the oppression of being underground, the architects have cut a series of lightwells inside the hall's glass face. From beneath, the views clear up to the hall's curving light-reflective ceiling are dramatic, sustaining the excitement of arrival in one of the world's most exhilarating cities. P. M.

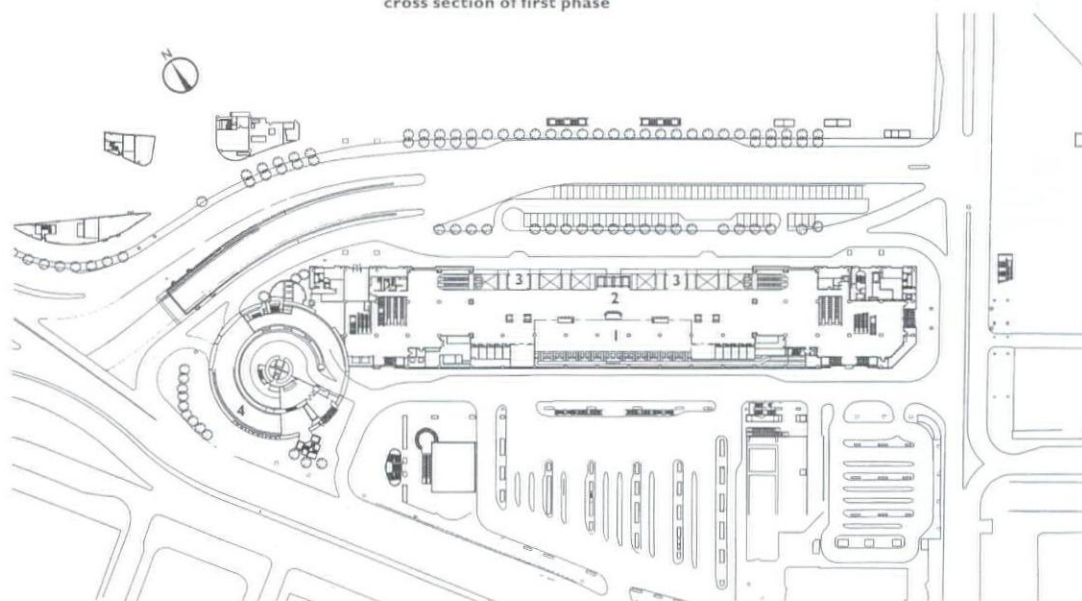


site plan

- A new station
- B retail podium
- C Station Forecourt
- D Exchange Square
- E office tower
- F Star Ferry terminal
- G Harbour
- H HYF ferry piers
- J Connaught Road Central
- K General Post Office
- L Statue Square

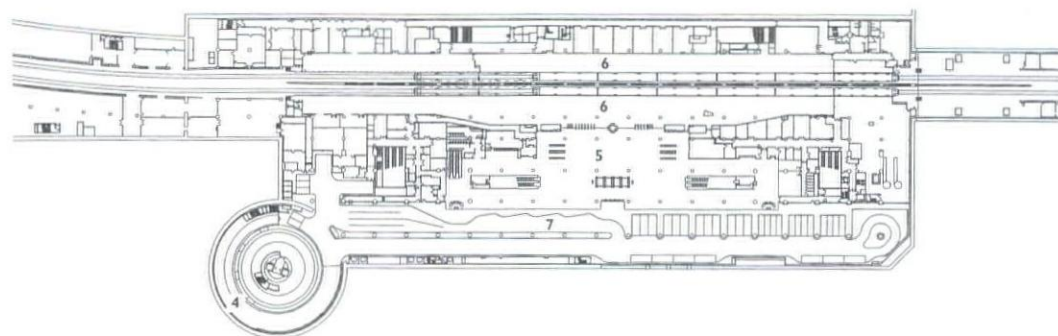


cross section of first phase



ground level

- 1 In-Town Check-In Hall
- 2 AEL entrance concourse
- 3 voids
- 4 vehicular access ramp
- 5 AEL station concourse
- 6 AEL platform
- 7 taxi lay-by



AEL platform level (scale approx 1:2500)

Architects

Arup Associates in association with
Rocco Design Partners

Structural engineer

Ove Arup & Partners (HK)

M&E engineer

Meinhardt (M&E)

Quantity surveyor

Davis Langdon & Seah

Main contractor, specialist glazing, steelwork

Aoki Corporation

Photographs

Gareth Jones, Colin Wade, Stephen Jones

Through its fluid form and organizational clarity, this new railway station at Frankfurt Airport aims to ease the chaos and congestion of one of Europe's busiest air terminals.

FRANKFURT GATEWAY

Since 1955, Frankfurt International Airport has been Lufthansa's home base. It is the eighth largest airport in the world, the most important one on the European mainland and gateway to the Continent for other international airlines. Over 40 million passengers annually pass through this vast complex of overlapping and interconnecting surface and air, local, national and international transport networks.

Der Spiegel magazine has called Frankfurt Airport a 'Monster ... the impossible airport'. Air

travel has doubled in the last decade and is forecast to grow by at least 5 per cent annually. Not least of the problem is how to deal with transport links on the ground. The existing railway station in the basement levels under the airport has been an important element in this passenger servicing system.

While it will continue functioning for district and intercity diesel trains, a new station terminal by BRT Architekten has been built for the latest generation of high-speed electric trains. Consisting

of 38 000 sq m of public and technical service areas, it forms a key part of the modernization and extension programme for both German Railways' national network and Frankfurt Airport.

In the wake of several competition wins for German Railways, Hamburg-based BRT Architekten are gaining a modest reputation for a combination of tectonic expression and fluid morphology. The new station occupies a site above ground, parallel to the airport and associated congress hotel, but on the opposite side of an

intervening autobahn. The 700m long curved edged body of the station floats on pairs of splayed telescopic aluminium clad columns over partially sunken tracks below. As an autonomous structure it is linked to the airport terminal's departures and arrivals by a high level covered footbridge, a flattened rib cage of steel clad in aluminium, which cuts through the congress block and over the adjoining motorway.

Arriving under an oval glass dome on the roof of the station, passengers ride escalators down

1
Computer generated image of the new station on the edge of Frankfurt airport. Its elegant form contrasts with the shambolic agglomeration of the airport complex.

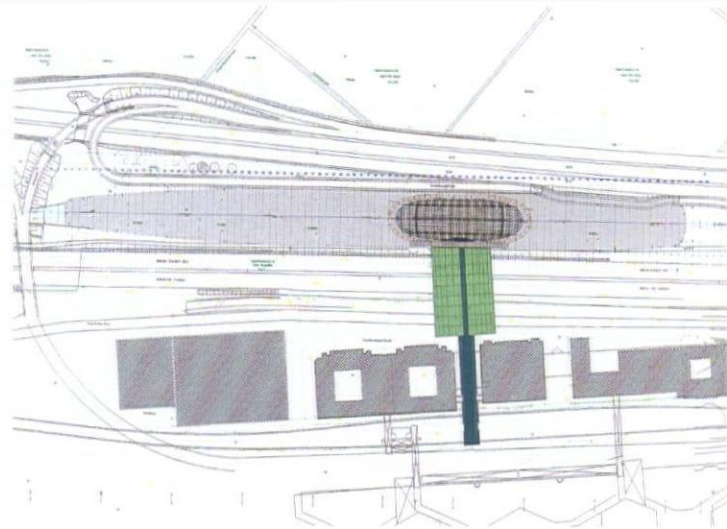
2
Platform level, with the glazed dome of the arrivals hall and intermediate lounge level above.

3
The long platform roof is supported on pairs of splayed columns.

4
The luminous volume of the arrivals hall; a modern reinterpretation of the nineteenth-century glass train shed archetype.







site plan

through a light-well to the trains. The 60m clear span concrete structure, roofing two platforms and four lines, is open to daylight and natural ventilation between the supporting perimeter columns. Waiting and alighting areas on the platforms are colour coded using light and dark reconstituted stone. A silver aluminium soffit folds around the enclosed station areas above. Sandwiched between roof dome and platform levels are 7500 sq m of lounges, planned for Lufthansa and railway club class

passengers, and the ubiquitous shopping facilities.

The roof level arrival hall under the dome is spectacular. An uninterrupted 360 degree panorama of sky can be viewed through the canopy of glazed panels suspended internally from steel arched ribs. The glazing blocks are designed to reduce glare, but there is still enough light to bounce off the St. Baudille limestone flooring and filter down into the well of the spaceship below.

The station is only the first stage of site development.

Frankfurt Airport Authority, who own the air rights, are planning to top it with an entertainment centre. Foundations and superstructure can support another six double-height or 12 single storeys. It is proposed to enclose these additional functions under one homogeneous membrane, so maintaining the sleek, tubular airship form. LAYLA DAWSON

Architect

BRT Architekten (Bothe, Richter, Teherani), Hamburg

Project team

Berthold Staber, Christian Feck, Lutz Gnosa, Frank Görg, Michael Horn, Wolfgang Labsch-Boga, Katja Pahl, Ali Pakrooh, Monika Pfretzschner, Claudia Springmeier, Peer Weiss, Christopher Wilford, Arndt Woelke, Katrin Koulouri, Irene Manhardt, Ulf Schröder, Jürgen Wilhelm

Structural engineer

Binnewies

Services and lighting consultant

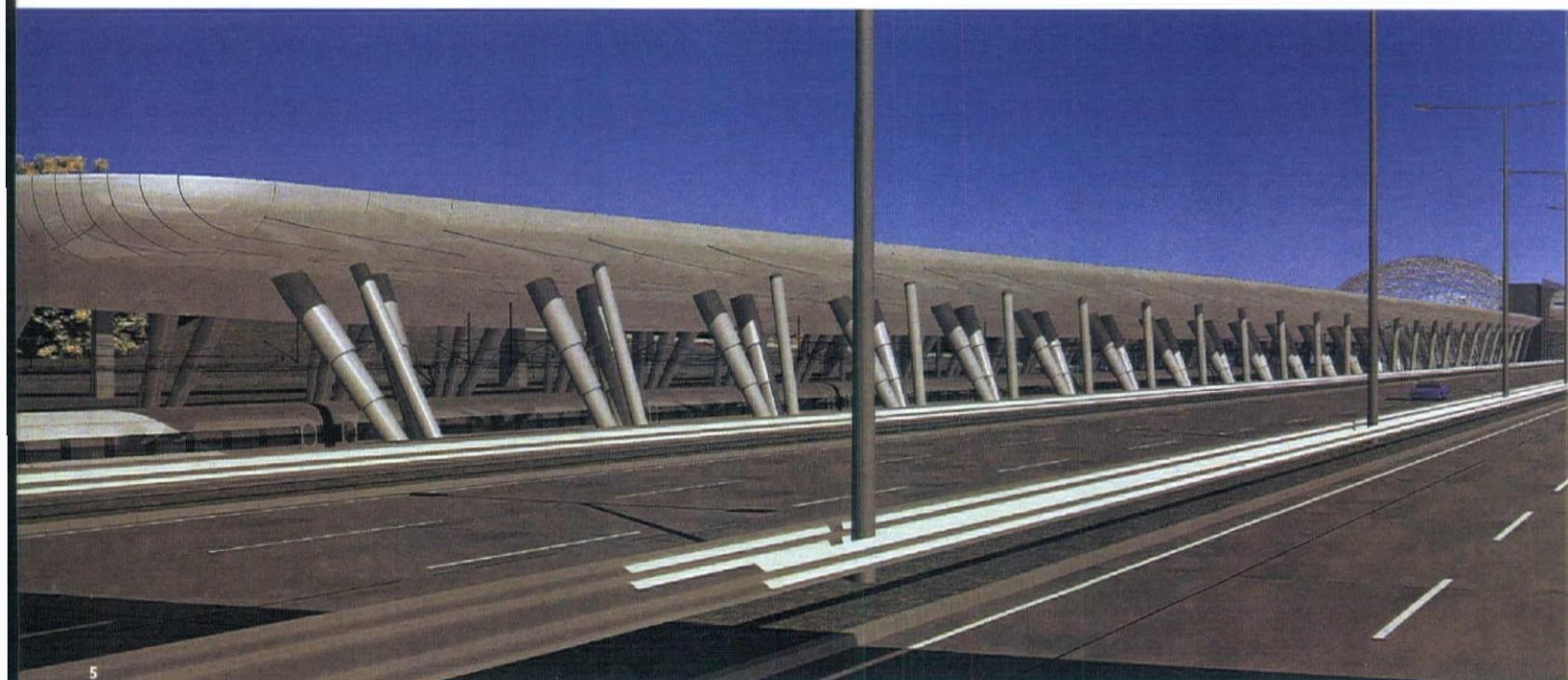
HL-Technik

Computer generated images

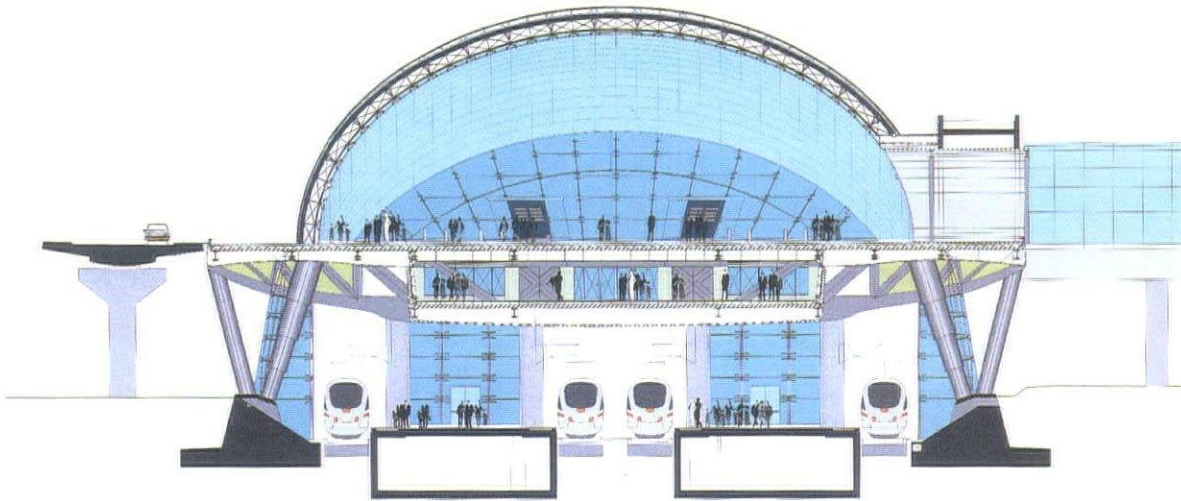
Datenland, Erik Recke

5

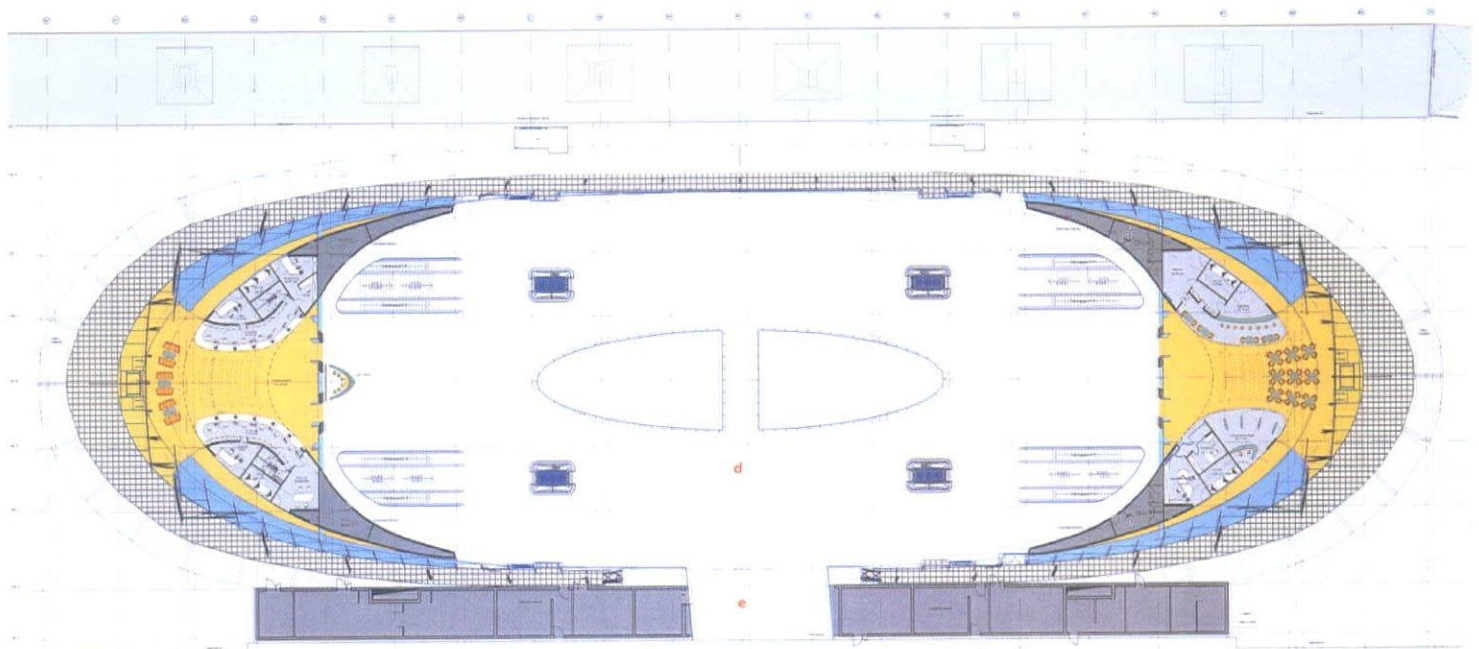
The sleek platform roof runs along the edge of the motorway. The 700m long structure encloses partially sunken railway tracks below.



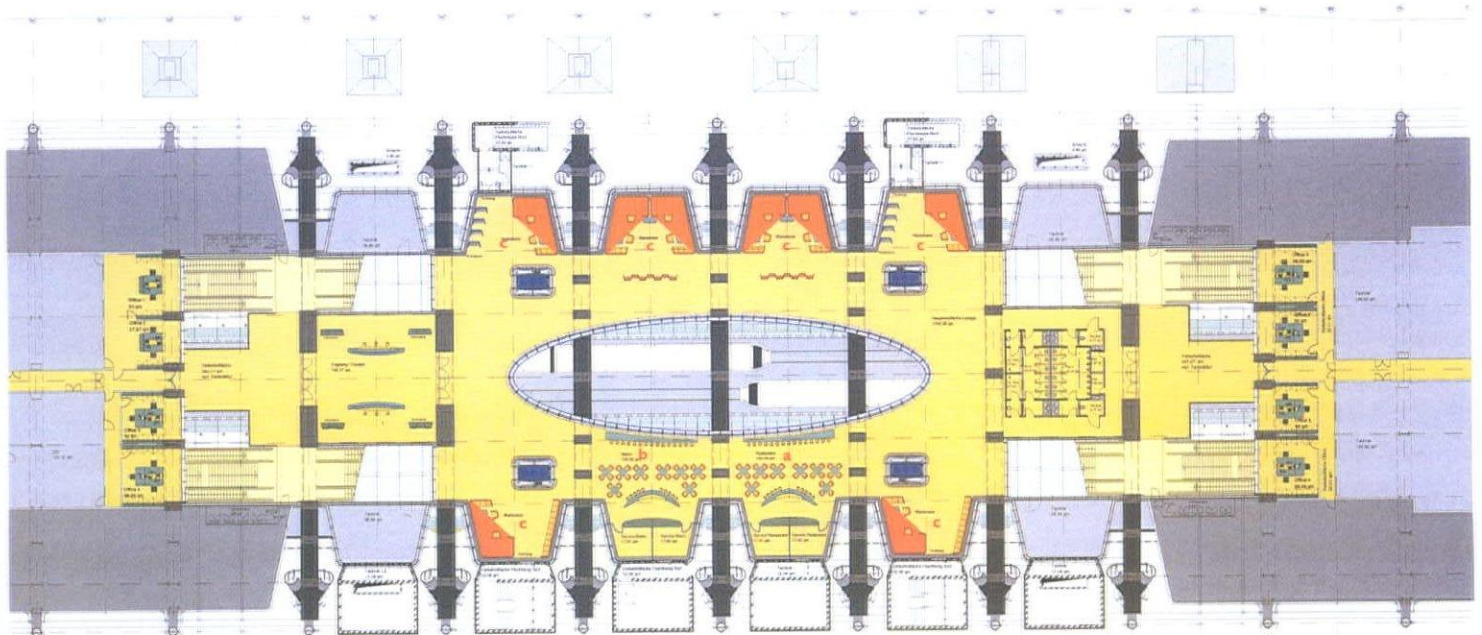
- a restaurant
- b café
- c lounges
- d arrivals hall
- e bridge link to airport



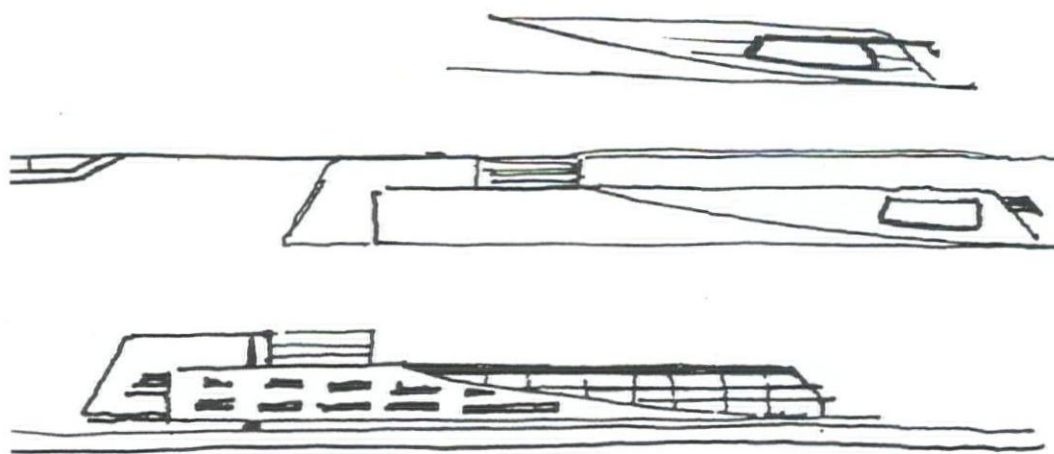
cross section



upper level plan – arrival hall



intermediate level plan (scale approx 1:1000)



HIGHWAY PATROL

Continuing the French tradition of building inventively with metal and glass, this motorway control centre is an imaginative response to a functional brief.

Scything through the outskirts of Paris, the Grande Axe connects the western suburbs with the city centre. From the hub of the Arc de Triomphe, the arterial motorway passes into a tunnel under the business district of La Défense to emerge in the suburb of Nanterre. It then crosses the Seine and streaks off into the leafy Parisian hinterland. The linear route defines a strong east-west axis and acts as the main gateway to the city. Odile Decq and Benoît Cornette were asked to design a new centre for the highway control agency which patrols the surrounding motorway network. Exploring

notions of aerodynamism and material lightness, their response to an essentially functional programme imaginatively transcends the limitations of site and brief.

The new control centre is located below a motorway viaduct, at the point where the road emerges from the tunnel running under La Défense. The viaduct skirts along the western edge of Nanterre, through a featureless, melancholy suburban landscape of tall apartment blocks and elevated railway tracks. Decq and Cornette's strategy was to conceive the new building as an

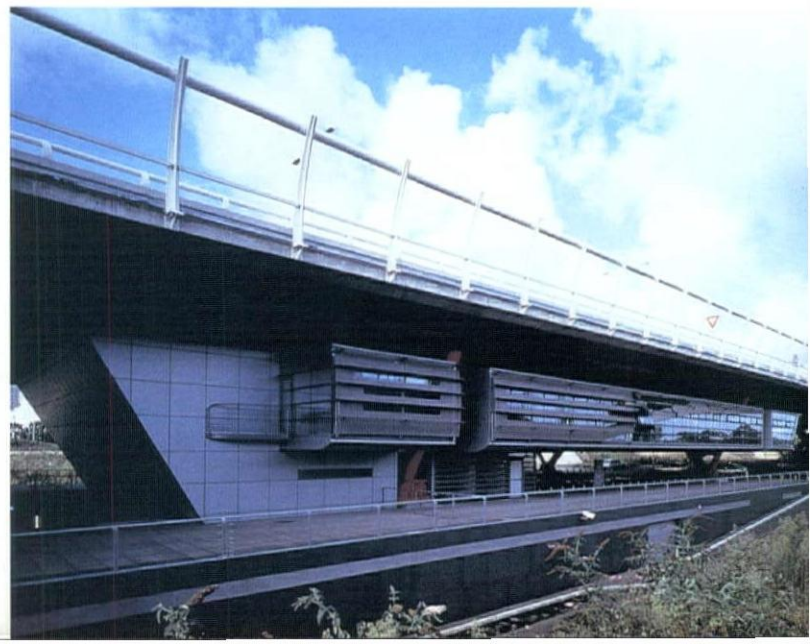
integrated extension of the motorway viaduct, rather than an isolated object. This involved reconfiguring the viaduct structure as a series of relatively slender curved steel arches (painted bold red), instead of the more usual massive concrete pillars. Suspended between two of the viaduct supports, the linear volume of the control centre appears to float weightlessly underneath the motorway, like a submarine stealthily stalking the traffic above. The rationale for hoisting part of the complex above ground relates to a more general programme of phased civic

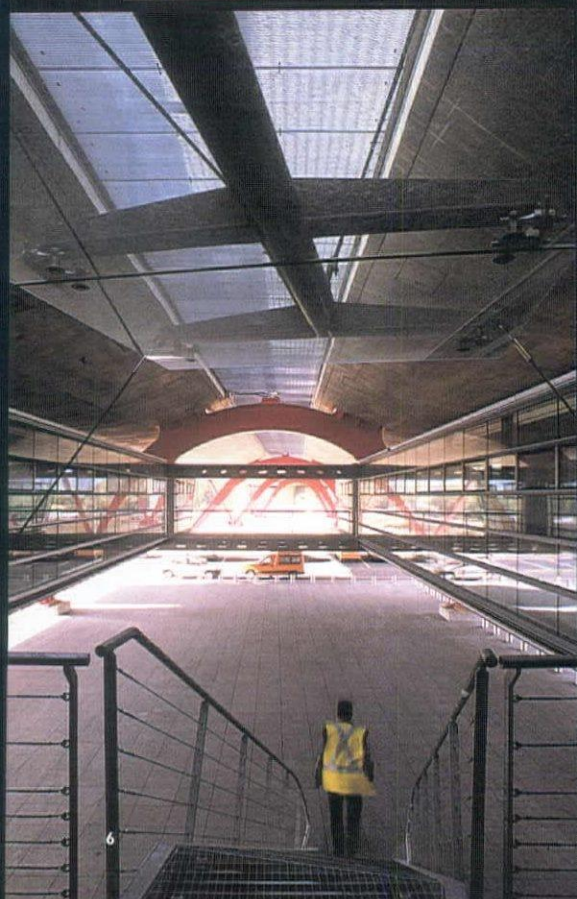
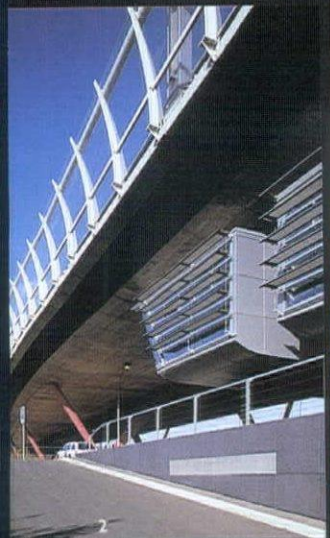
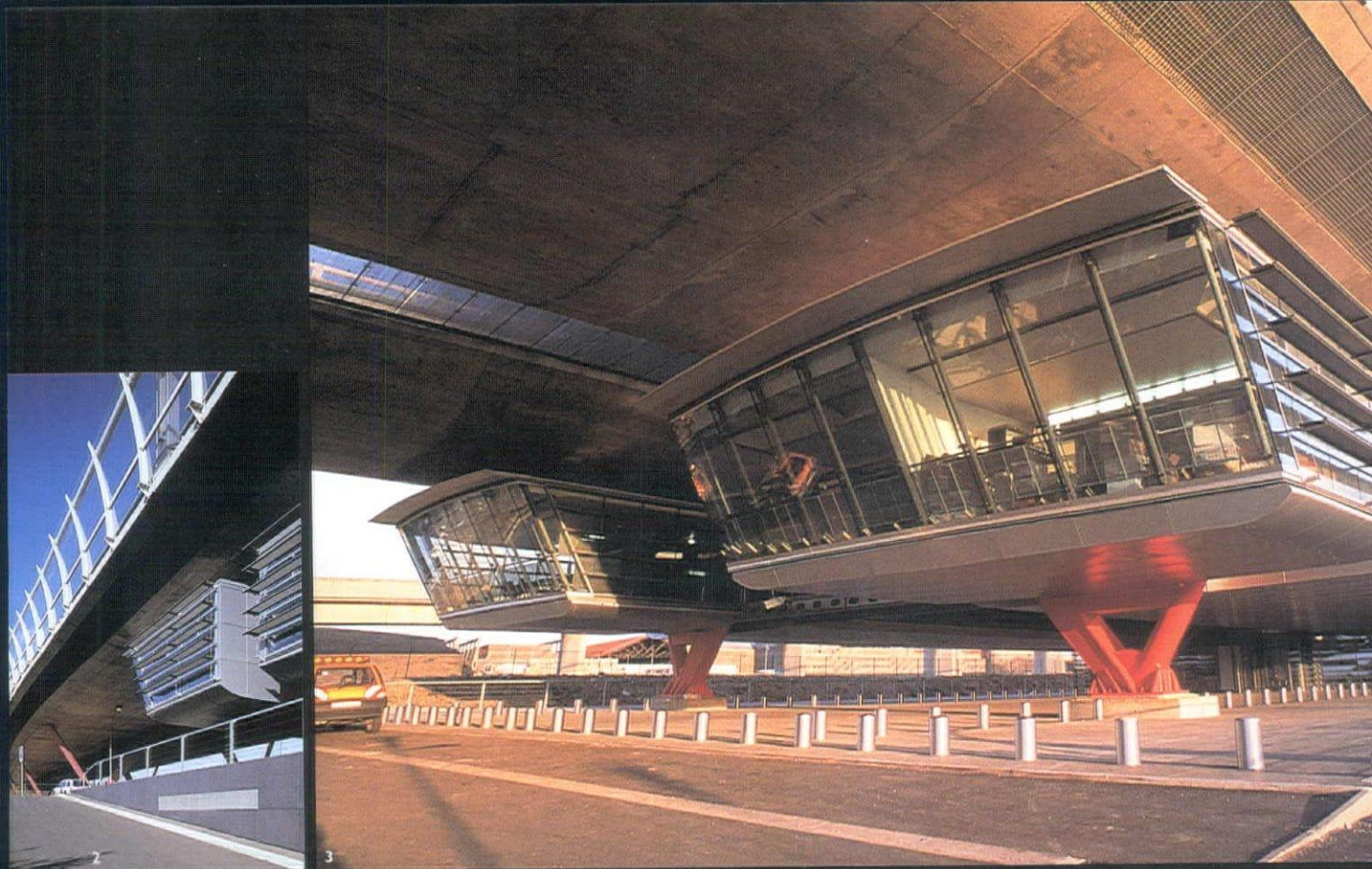
MOTORWAY CONTROL CENTRE, NANTERRE, FRANCE

ARCHITECT

**ODILE DECQ AND
BENOIT CORNETTE**

- 1 The sleek volume of the control centre is slung under the motorway viaduct.
- 2 Motorized brise-soleil form the external layer of the metal carapace.
- 3 The chamfered wings of the U-shaped plan are fully glazed, like giant unblinking eyes.
- 4 The structure stealthily stalks the traffic on the motorway above.
- 5 A subterranean podium houses garages for police and motorway service vehicles.
- 6 Wings are linked by a glazed bridge and the concrete structure of the motorway viaduct is replaced by curved steel arches.
- 7 A steel staircase leads up to the suspended main floor which houses the control centre.





HIGHWAY CONTROL
 E, NANTERRE, FRANCE
 PROJECT
 DECQ AND
 CORNETTE

improvements. New landscaping
 and a park will eventually be
 constructed on a strip of
 wasteland to the south of the
 site, so it was considered
 important to minimize the
 impact of a potentially hermetic,
 monolithic structure.

Divided into two sections, the
 complex is organized to place
 vehicles below ground and
 humans above it. Detached from
 the main elevated volume, a
 secondary subterranean box
 houses garages, services and
 storage. Its roof forms a podium
 courtyard giving access to a
 small police station at ground
 level. Facilities for highway
 patrol staff, such as cellular
 offices, conference areas, and
 radio control rooms are

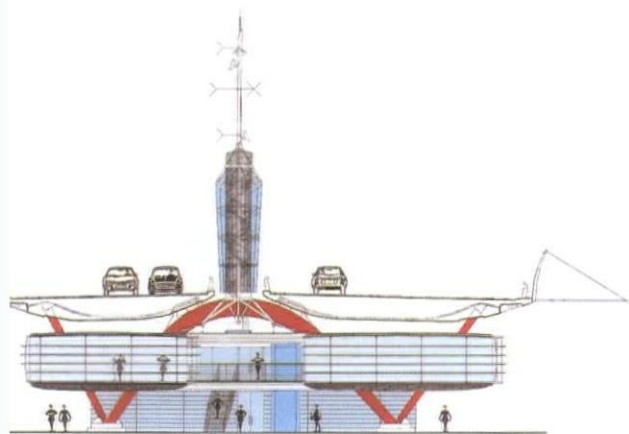
contained in the suspended
 upper floor. This level is
 arranged in a simple U-shaped
 plan, with the sharply chamfered
 glazed ends of the two wings
 resembling a pair of giant,
 ever-watchful eyes. An enclosed
 glazed bridge unites the wings at
 their mid point, both facilitating
 and expressing circulation. Clad
 in horizontal panels of glass and
 aluminium, the long lateral
 flanks of the building are
 overlaid with an external
 carapace of perforated metal
 louvres that function as
 motorized brise-soleil.

Emphasizing kineticism and
 lightness, the sleek, aerodynamic
 forms are clearly inspired by the
 poetry and power of moving
 bodies. Hearteningly, despite

occupying a virtual no man's
 land, the building appears well
 cared for. Decq and Cornette's
 appropriation of industrial
 materials and the evident relish
 and care in the way these are put
 together reflects an affinity with
 the sophisticated exploration of
 structure and tectonics most
 obviously characteristic of High
 Tech, but it also extends the
 French tradition of building
 inventively with metal and glass
 begun by pioneers such as
 Prouvé and Chareau. The only
 minor cause for regret might be
 that because of its remote
 location and determinedly
 non-public function, the control
 centre seems destined to remain
 an undiscovered gem.

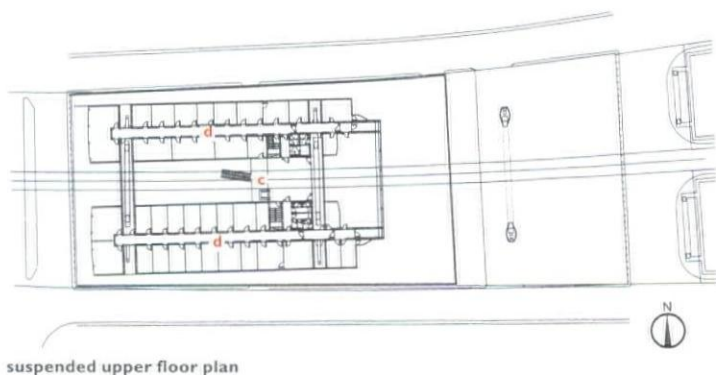
CATHERINE SLESSOR

by + Benoît Cornette, Paris
 photos
 by Michel
 courtesy of the architects

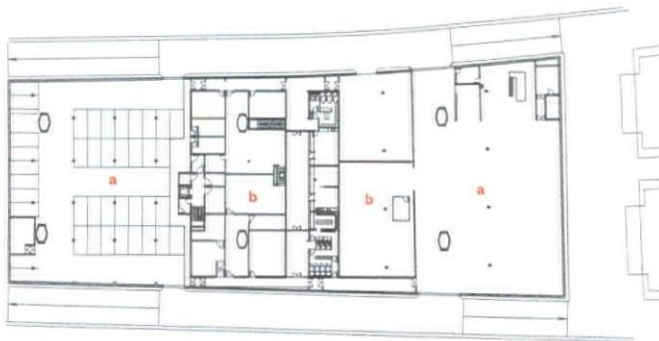


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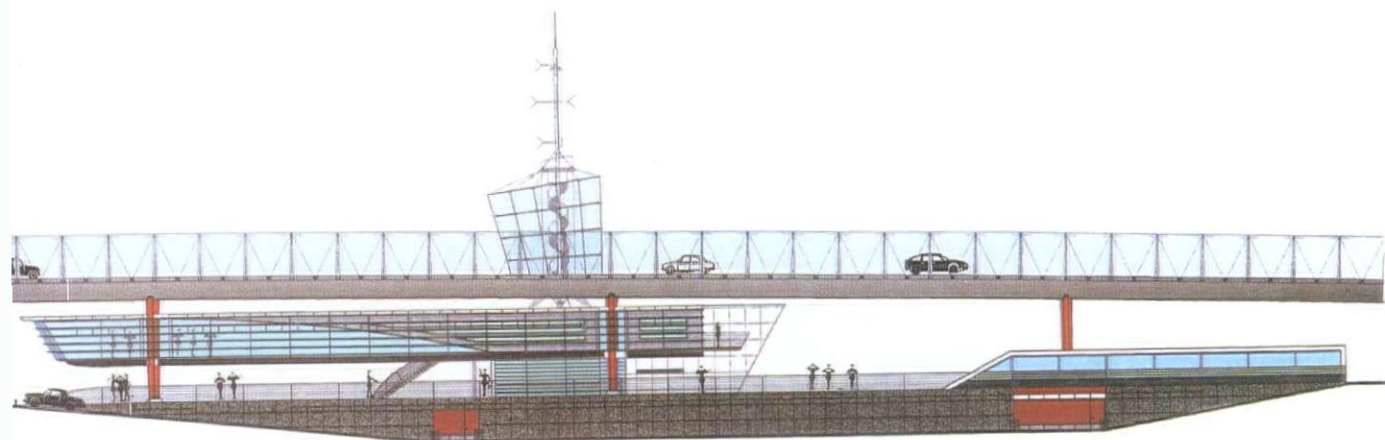
- a garages
- b plant and storage
- c entrance
- d offices



suspended upper floor plan



lower ground podium level plan (scale approx 1:1500)



tion

OFFICES, NEBRASKA, USA

ARCHITECT

RANDY BROWN ARCHITECTS

- 1 Reception area, asymmetric desk on left.
 2 Reception: angled posts of conference room to right.

Well connected

These new offices in Omaha, Nebraska are a practical demonstration of the contractor client's skills and the architects' ingenious inventiveness.

Randy Brown's commission to design offices for the John Luce Company in Omaha, Nebraska, was the direct consequence of Luce's involvement in constructing an office building designed by the practice. John Luce is a general contractor with a skilled team of design-conscious craftsmen. Having experienced at first hand the architects' idiosyncratic approach to structure and the organization of space, and intrigued by the pleasure they take in using ordinary materials in extraordinary ways, Luce asked the practice for offices that would be a practical demonstration to clients of his firm's craftsmanly skills.

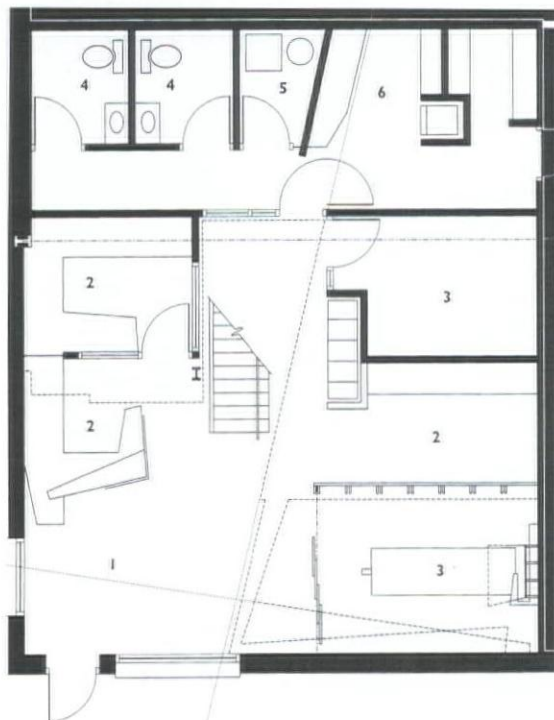
At first glance Brown's work has a delightfully serendipitous quality. But the constructivist language employed in the organization of space is very carefully composed and the assemblies possess vigour and a kind of rough elegance. The house and studio Brown designed, also in Omaha (AR

November 1997), bristles with exposed posts and joists, visible connections, angled planes and flying pieces of metal. Spaces bleed one into another vertically and horizontally so that they become ambiguous. You can see the same hand at work in subsequent schemes, and particularly clearly in John Luce's new quarters.

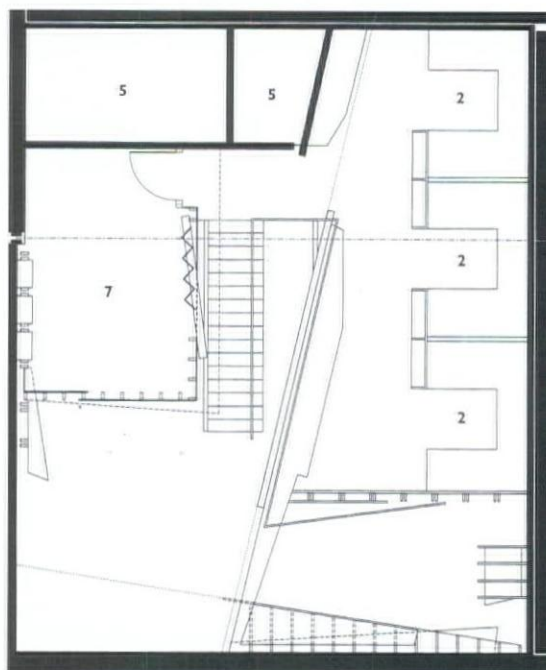
The scheme provides a reception area, workstations, a private office and conference rooms, all of which have been inserted into the amorphous interior of a prefabricated metal warehouse shell. Accepting the industrial nature of the building, the architects retained the concrete floor, giving it a coating of epoxy resin, and exposed the rust red structural steels and parts of the corrugated metal shell.

Since a great deal had to be packed into limited space, a mezzanine gallery was constructed. Irregular in plan, and reached by stairs in the centre of the building, the gallery





plan: ground floor (scale approx 1:140)



plan: mezzanine gallery

- 3 Mezzanine: to left, private office enclosed in Plexiglas, to right, workstation gallery.
- 4 Conference room with concrete table. Reception desk in background.
- 5 Translucent Plexiglas wall meeting corrugated metal shell.
- 6 Sculptural composition of concrete meeting table and overarching metal sheet.

Architect

Randy Brown Architects

Project architects

Randy Brown, Matthew Kruntorad, Ken Koense, Geoff DeOld, Kimberly Brown.

Contractor

John Luce

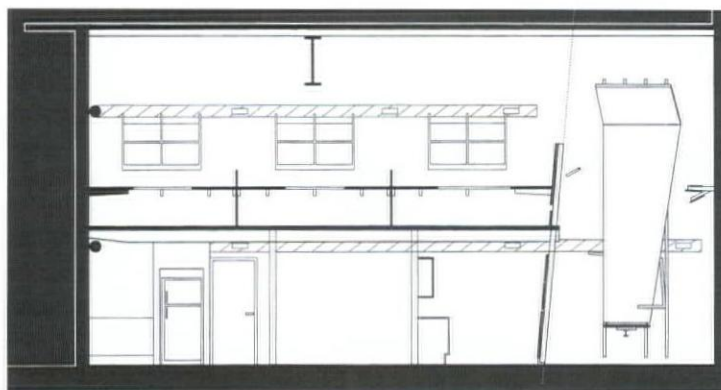
Photographer

Farshid Assassi

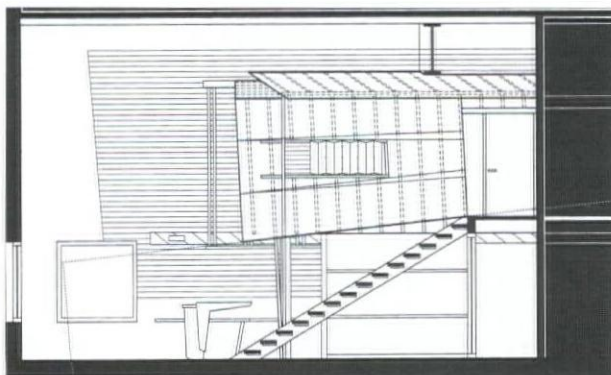
OFFICES, NEBRASKA, USA

ARCHITECT

RANDY BROWN ARCHITECTS



long section



cross section

- 1 reception
- 2 workstation
- 3 conference room
- 4 lavatory
- 5 plant
- 6 communal room
- 7 private office

describes a series of voids so that some spaces on the ground floor, such as the reception area and conference rooms, have clear views through to the roof of the building.

Volumes are contained and given shape by floating divisions of various degrees of transparency. A solid painted wall divides off a service section with lavatories at the rear; sheets of birch plywood fixed to angled posts form a latticed screen between a conference room and kitchen; upstairs, sheets of Plexiglas fixed to pinewood frames make translucent walls around a more private room.

Introducing luminance into the building was a concern. There are few openings in the metal shell and the architects were prevented by the planning authorities from cutting skylights into the roof (it was thought they would leak). So standard shopfitting fluorescents concealed by roof members are used to create an impression of daylight which is diffused through the voids into the ground floor and supplemented

by local sources of light.

Connections are vigorously expressed and various, and are an important part of Brown's constructive aesthetic. On one side of the staircase the treads abut the stringer; on the other, they run over the stringer to support the metal uprights of fine balustrading. And manifesting Brown's delight in using materials devised for one purpose in other ways, the treads are made of lengths of Glulam truss – just as the translucent walls are made of the plastic sheeting normally used for signage. At times, such subversions reach poetic heights. In a ground floor meeting room, an overarching metal sheet sheds a silvery radiance over a concrete table top – the whole composition acquires a sculptural presence.

This is a clever scheme. The vaguely unfinished air of the various assemblies and the flashes of real elegance, the detailing and conjunctions of materials, are continually intriguing. With imagination and skill, a great deal has been conjured out of very little. P.M.

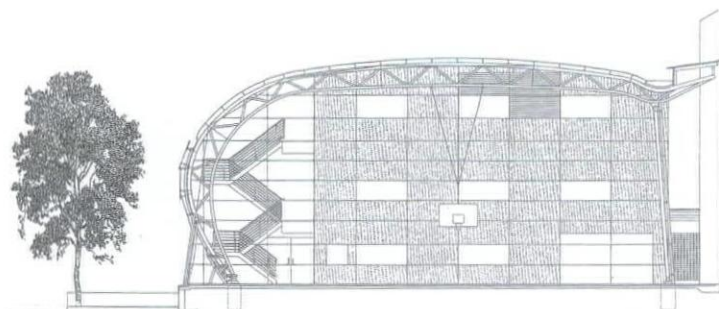




- 1 North and east faces of the sports hall.
- 2 Mural painted by community artists in the '60s lines the west side of the centre.
- 3 Sports hall containing indoor basketball and volleyball courts, illuminated by perimeter glazed wall and skylights.

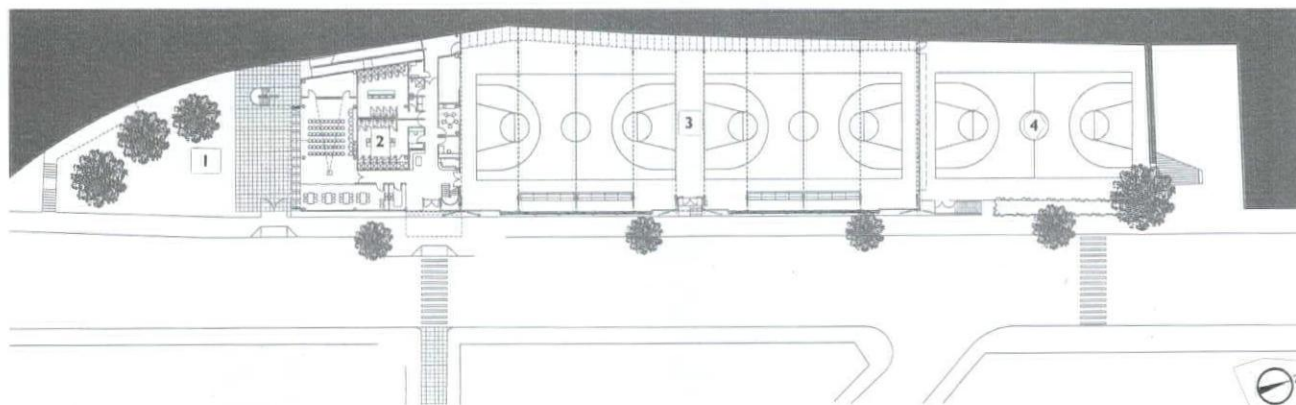
Body works

Design of a new recreation centre celebrates the building's proximity to Sydney Harbour Bridge while respecting the scale of a historic neighbourhood.



east-west section through sports hall

- 1 children's playground
- 2 facilities building
- 3 sports hall
- 4 outdoor court



ground floor plan (scale approx 1:1000)

Ed Lippmann designs elegant houses for private clients in and around Sydney (AR March 1996). Built on Modernist principles and subtly complex, they are the products of an interest in developing lightweight steel and glass structures.

King George V recreation centre for the city of Sydney was the practice's first civic commission. The site in The Rocks was a sensitive one. This is the oldest part of Sydney, to the west of Circular Quay and the Opera House, characterized by nineteenth-century buildings and narrow hilly streets. There was a twentieth-century invasion in 1936 when Sydney Harbour Bridge was built, springing from the top of the Rocks across the harbour divide to the northern shore. As if connecting the historical gap, the site is wedged between the neighbourhood street on the east, and the boundary wall of the elevated freeway to the bridge, curving from the south along its west side.

Sporting precedents already existed in the form of a dilapidated 1920s sports hall (demolished) and a children's playground, which was retained and improved at the south end. The architects were also asked to retain a large '60s mural painted by community artists across the freeway wall.

The new centre has an outdoor court on the north, a sports hall with two indoor basketball and volleyball courts, and an adjoining two-storey concrete frame building. There are community and changing rooms on the ground floor with direct access to the hall, a gymnasium on the first and a

roof terrace with stunning views over Circular Quay. While the architects have conformed to local scale, the presence of the bridge, an iconic piece of twentieth-century industrial design, suggested other industrially poetic possibilities which they have exploited.

The main architectural drama is in the curvilinear structure of the sports hall's roof. Spanning 20m it provides 9m of clear height inside the building while minimizing its impact on the street. A series of curved steel trusses are pin-jointed to the slab and supported along the decorated west wall by pin-jointed props. This structure is covered by corrugated steel sheet, screwed to steel purlins spanning the trusses, and lined internally with a corrugated steel ceiling. To give views of the mural from the street, a glazed wall, 3m high, wraps round the building. This, with central skylights, floods the interior with luminance. A skylight along the wall illuminates the mural.

This is an exhilarating space; made so by the lightness and expression of the structure, the breadth and length of the shining wooden floor terminating in brilliant yellow walls, and graphic drama of the mural. It is naturally ventilated with cool air being drawn in through low louvres in the glazed wall on the east, and hot air expelled on the west through high louvres below the long skylight. PENNY MCGUIRE

Architect

Lippmann Associates

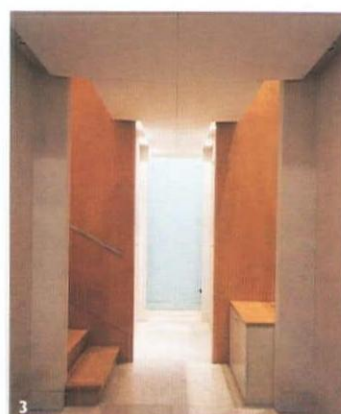
Design team

Gerhard Abel, Nerida Bergin, Scott Lester, Ed Lippmann, Rolf Ockert, Brett Sperling

Photographer

Ross Honeysett





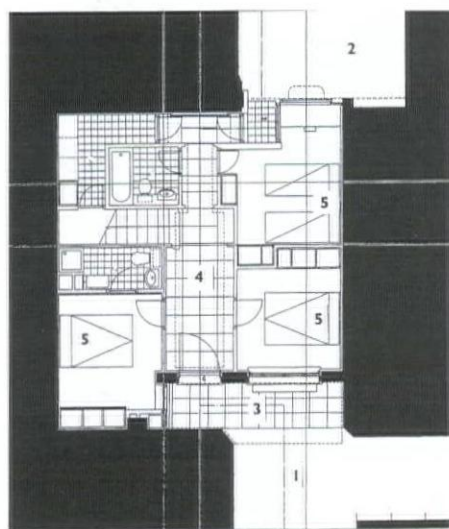
Light house

In designing a compact house the architect manipulates light and space poetically to create a luminous interior.

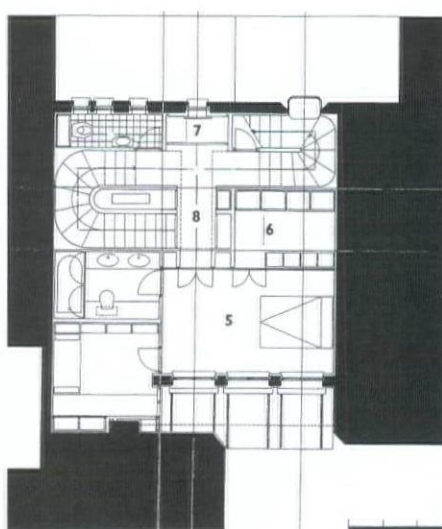
PRIVATE HOUSE, CENTRAL LONDON

ARCHITECT

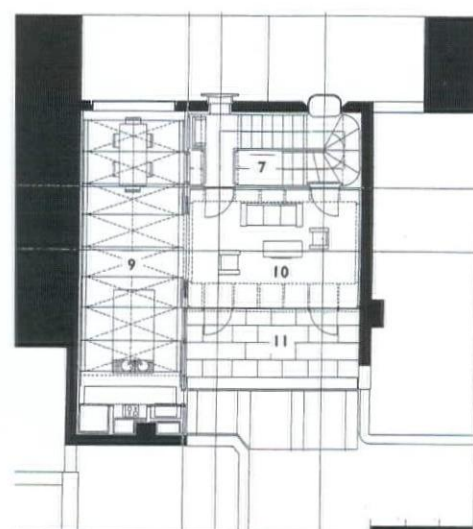
NIALL McLAUGHLIN ARCHITECT



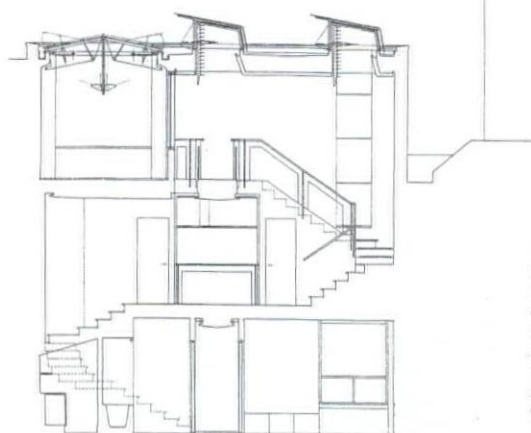
ground floor plan (scale approx 1:180)



first floor plan



second floor plan



east-west cross section

- 1 mews court
- 2 garage lane
- 3 glazed porch
- 4 entrance hall
- 5 bedroom
- 6 dressing room
- 7 void
- 8 bridge
- 9 kitchen/dining
- 10 sitting room
- 11 terrace

- 1 North-facing rear wall: an abstract pattern with windows set flush into render.
- 2 South facing exterior with casement windows, flanked by neighbours, tucked into corner of mews court.
- 3 Entrance hall terminating in light reflective plane of rear wall.
- 4 Stairs ascend under skylight.
- 5 Kitchen/dining room under screened skylight with cross views to living room and stairs.

Architect

Niall McLaughlin Architect

Builder

Barry McGowan Construction

Photographs

Nicholas Kane

London is full of odd hidden corners. This house, designed by Niall McLaughlin, is one of three mews houses clustered around a tiny cobbled courtyard in Knightsbridge, behind an ivy covered portal. At the rear, the backs of tall terraces as high as Glasgow tenements stretch north to Hyde Park.

Though it was originally built in the late nineteenth century, the existing house had been substantially altered in the 1950s and McLaughlin has completely rebuilt it. The ground and first floors contain bedrooms and bathrooms for various members of the family, and the second floor contains the living quarters with kitchen, sitting room and south-facing terrace.

Because Knightsbridge is a conservation area, planners

asked that the main face should respect local character: windows facing south on to the courtyard are plain wooden casements that suggest the traditional without imitating it and accord with the simple glass canopy over the front door. In contrast, the rear face is a flat abstract composition of windows cut into a white plastered wall.

The main problem was getting light into the building, for it is hemmed in almost completely on three sides. Accordingly, McLaughlin pulled back the main face to allow the insertion of side windows to the west of the front door; on the second floor he retracted the roof behind a parapet to create the terrace, which is lined by the glass walls of the living room.

The main conduit of light is the

stairwell at the rear of a narrow entrance hall. Illuminated by skylights and by windows cut into the rear wall, the stairs curve upwards through a void.

At first floor level a bridge leads over the void to the main bedroom and bathroom. Turning in the other direction, a tiny view of the campanile of the Russian Orthodox Church is afforded by a piece of clear glass in an otherwise opaque window.

Blocks of orange and yellow on the walls are brilliant in the gauzy light: the pale blue rear wall rising two storeys under a skylight acts as a light reflective plane.

This is a tiny house but McLaughlin skilfully manipulates light and space, cutting through dividing planes, allowing vertical and horizontal glimpses of what is beyond. On the second floor the

T-shaped plan, formed by the terraced sitting room and skylit kitchen (both with windows on to the stairwell), permits cross views through the building. Besides creating an impression of space, the device produces magical kaleidoscopic patterns of light on walls (seen before in McLaughlin's work – AR September 1998) as bluish north light encounters warmer light from the south.

While the sitting room looking south on to the terrace is a clear bright space with orange furniture, the kitchen/dining room looking north over the tall terraces, has a different character, with luminance flooding through the long skylight diffused and made milky by a white diaphanous screen, like the roof of a tent. P.M.



Three-quarters of the 150 million inhabitants of Brazil live in towns, under notorious conditions. But one town, Curitiba, is an exception. Situated 700km south of Rio and 100km from the Atlantic coast, it is the capital of the State of Paraná and contains 1 600 000 *curitibanos*, descendants of Polish, Italian, German and Ukrainian emigrants, and has an economy (services, trade and industry) at the normal level for Brazil. Its natural situation is poor and its climate is average. Like other states, Paraná was invaded by a mass of peasants expelled by mechanized agriculture (1.5 million poor peasants were thrown out of work).

Nothing would distinguish Curitiba from another town if it were not for the action of its mayor, Jaime Lerner, an architect. He has made all the difference. He quickly understood that a town is designed not by an architect but by politics. So he contrived to be elected mayor for three alternate terms in 20 years and is ceaselessly improving the urban ecology of Curitiba.

He realized that grandiose solutions never produce the promised results and that abstract Modernism simply does not work. In 1970, when he first became mayor, the new town of Brasília was shining in all its glory. Today it is a sorry sight, strange and uninhabitable. Lerner realized that all this hardware of glass and steel towers, these underground stations, these dizzy suspension bridges and motorways did not really help anyone in their everyday life.

Masterplans

In the '60s, an attempt was made to impose a 1942 plan by the French town-planner Agache. He proposed widening the road system, demolishing the borders of avenues and radially transforming the city on behalf of the private car. Just like North-American towns.

This plan was rejected by architects, engineers and by the Development Bank, who requested study of a new and more realistic proposal. As early as 1966, a new plan was prepared by the Lerner team and was accepted, then frozen in '71 under the harsh dictatorship. This latter plan closed the main road to private traffic, which annoyed some private interests. The earlier plan was concentric: to go from one district to another, traffic, both public and private, had to pass through the centre, which would certainly soon become choked. Therefore the streets had to be widened and the spiral of demolition and bottlenecks began.

The new plan was linear: the town was authorized to spread only along specified lines. The historical centre, situated somewhat apart, could then become quietly pedestrianized. A ring-road connected

the fast north-south and east-west bus routes. Four concentric lines were added with stations at intersections with the earlier lines.

These express radial routes would have needed a width of 60m, which was impossible. The device adopted in the plan was to divide this flow intelligently between three neighbouring parallel streets, the first and the third being one-way for private travel and the centre being reserved for the express bus, and later for the tram or surface railway when the means were available. All this was co-ordinated with very little expropriation. The routes gave a structure to development without allowing it to occur anywhere at random and without impossible traffic conditions.

Parks

The first act of the local administration had been to look after the parks and to plant many trees. The inhabitants had to be persuaded by mobilizing them with a slogan: 'We bring shade, you bring fresh water' (an old Portuguese proverb). Previously the town had planted 5000 trees per year, and this was increased to 60 000 trees per year. In 20 years, Curitiba has increased the green space per inhabitant from 0.5m² to 52 m². The intention was to plant one and a half million trees in 20 years for, since the 1988 murder of Chico Mendes (the campaigner to save the rainforest), Brazil had been on the defensive in ecological circles.

During a winter night in '72 the work of pedestrianizing the main street began in the greatest secrecy and was completed in 72 hours. In spite of the desire for participation, the preliminary work had been carried out without publicity. The wager succeeded. Participation was not by the inhabitants but rather by urban guerrillas. The car addicts had decided to reconquer the territory by brute force, but on Monday morning when the lorries arrived to demolish everything, they were faced with a group of children painting paper on the ground. This was the first successful municipal sit-in for protecting pedestrians. Even so, it took two years more to set the express buses in operation, an essential accompaniment to the pedestrian.

The Mayor organized well-constructed and popular parks: the Iron Wire Opera, a round structure of completely glazed steel tubes, and a new Botanical Garden in which the greenhouses were also of steel tubes and domes. They were very popular.

Run-down quarters

Rehabilitation of the run-down areas started by adding the public services which they lacked, paving the streets and in particular

Creative Curitiba

Curitiba in Brazil is one of the most remarkable cities anywhere. Led by an architect mayor, the citizens have created a series of interlocking systems of transport, land use and waste disposal that makes Curitiba the ecological capital of the world. Lucien Kroll, the distinguished Belgian architect, describes the achievements.



working with the communities adjoining the *favelas* or shacks; their opinion was requested on all the projects. It was found that in shaky economies, shanty towns are a possible response to the immense influx of people without resources. It is surely better to improve them rather than to ignore or demolish them. Often, furthermore, the new constructions proposed in place of slums are violently rejected by the inhabitants. We must admit that our distaste for this approach is not economic but cultural. Town planning based on rational considerations alone is completely unsympathetic, in contrast to planning which originates in popular instincts regarding space and the urban image. This is a fundamental criticism, based on experience, of the alienation of Modernism. Which is the more reasonable approach?

Since lorries on the road system cannot reach the paths in the *favelas*, the slum dwellers are 'paid' for their rubbish, ie they sort the rubbish from the town and are repaid with vegetables, fruit, bus tickets and so on (green exchange). This is much less expensive than hunting for inaccessible clandestine waste dumps in the *favelas*. None of this, of course, is very visible.

Most Brazilian politicians begin their career as fabulous celebrities and end up barricaded behind the doors of their mansions, in fear of violence, the press or their rivals. Lerner walks peacefully in his town; he says the only people who ask him to stop are autograph-hunters.

Take the bus

Towns with roaring traffic but no budget should, Lerner advises, quickly forget luxury underground stations. He prefers to bring back the tram, which had been discontinued almost everywhere, and refurbish the bus. 'If properly laid out, a bus system can be almost as efficient as an underground railway' he says. It is also much less expensive: about a million dollars a kilometre for buses, 10 million dollars a kilometre for trams, and 100 million for an underground. Integrated transport is the crowning success of Curitiba, which any other town could imitate immediately – ie harmonizing the various routes and the various mass transport vehicles. For about 20 US cents, a passenger can change to any bus (express or local) and reach practically any place in the town. 'The trick in changeover is to integrate the various forms of transport, from buses to boats, to the underground and the bicycle' says Lerner.

On their own ground, buses are regular and fast, with express routes and a good network of ring-roads in the suburbs. Things are going so well that when I was there, taxis were complaining of hav-

ing no work (why spend so much if the bus is so efficient?) Stations in the form of tubular shelters have been set up at the bus stops. Travellers have already punched their tickets when they pour into the bus through wide sliding doors, and at the same time others leave on a level with the street, as in an underground railway. This speeds up the process (30 seconds instead of a few minutes). The widened bus doors are exactly adjusted to the doors of the stop.

It was necessary to design an original Brazilian bus, ie the suspension, the width of the entry and exit doors and above all the low platform, etc. Existing buses were never anything other than disguised lorries (though Brazil is a large manufacturer of buses). The average speed of the express buses in Curitiba (those on the Ligeirinho) is 20km/h, compared with 7km/h for buses in other Brazilian towns. The integrated network measures 500km by 50km on its own ground and carries 1 200 000 passengers.

At present, the pioneer line is overburdened; at peak hours it needs convoys of articulated buses (or bi-articulated, three buses in one, in accordance with the 'Curitiba' design – 370 passengers at once). The express buses and their metro-type stations allow travel at an average speed of 30km/h, which must be a world record. Soon there must be a changeover to the tram. In the past, 27 towns in South America were equipped with trams (Rio had 400km of lines), but they have all disappeared, as in most of Europe.

Initially Curitiba had half a million private cars, but they are no longer to be seen. There are still as many private car owners, but the cars remain in the garage. Bicycles however remain very important for walkers and workers. There is a 150km network of bicycle paths.

In 1990 Curitiba won the United Nations prize for environmental planning. Its bus system had received an award from the International Energy Conservation Institute at Washington. Its system consumes nearly 25 per cent less fuel than other towns. During the crisis, buses used fuel from sugar cane.

Lerner's success has certainly put him under an obligation to advise other towns throughout the world in order to improve their public transport.

Save the children

Children are the wretched victims of Brazilian town development. They are abandoned without protection and thrown into the street. When very young they form gangs, become dangerous and are massacred by the police. The object of the Pia (street-urchin) programme is to collect these children, who are in a critical situation. At



1
Iron Wire Opera in one of Mayor Lerner's new parks.

2
An extensive park system and massive tree-planting programme reinforces existing sub-tropical natural forest.



3



4

3 Wide doors of express buses exactly line up with bus stop openings and passengers board and alight at street level to reduce stopping times and facilitate people's movements.

4 Bi-articulated buses can take up to 370 passengers.

5,6 Tubular bus stops are modelled on metro stations. Passengers punch their tickets before boarding.

7 A popular system of rubbish separation and disposal facilitates recycling.

8 Part of the Unilivre, the Open University for the Environment.

9 Conservatory in a new park.



5



6

Curitiba a count was made of 500 children who had lost every link with their family and slept in the streets or in the parks. They are admitted (voluntarily or otherwise) into children's homes, and are given work, food, education (below age 14); 8000 children have been admitted. There will soon be 11 000 in 40 establishments.

Curitiba has also constructed crèches which it 'sells' to businesses. The children there are of pre-school age. Owing to lack of space, schools often operate in two four- or five-hour shifts, but are now being increased in order to provide a complete day. Before then, children were accommodated in disused buses.

Lerner is also trying to attack the problem by requiring businesses to adopt small groups of 10 to 15 children, feed them and give them work and teach them a simple trade or enable them to earn a little money in exchange for small, easy services such as errands, gardening, caretaking or minor office duties. Brazilian law forbids child labour but Lerner points out that, as in numerous situations where survival is difficult, the law turns a blind eye. 'In this country, if you are over-protective nothing will work. According to law a child must not work, but the law looks aside when the child is hungry, homeless or is working for a drug trafficker'. We visited the first of these homes. Curitiba is now considered the safest town in Brazil.

Relations between groups

In any metropolis, particularly in the Third World, businesses and officials find it difficult to associate with the informal network – illicit street vendors and homeworkers. Often there are collisions. Lerner recommends close connection between the two. His town has decided to invite the ragged band of vendors who clutter the streets into open-air markets which travel from one district to another. For residents who cannot pay the high prices in shopping centres, hardware stores or supermarkets, these markets will become pleasant bazaars which sell cheap clothing, building materials and bargains ranging from typewriters to tubas.

The rivers

The Iguaçu and its tributaries have the habit of violently flooding stretches of land (the main bed) which were carefully avoided by builders until the modern period. More recently, unlicensed buildings invaded the banks and the valleys. Every downpour in summer was followed by fatal floods, in spite of considerable investments in engineering work (underground galleries, trenches, dredging etc).

A solution was found by setting up easily-floodable reserve areas near the rivers (after some expropriations) and small barrages which

slowed down and soaked up premature floods. The rivers will gradually be freed from pollution (only 45 per cent of the inhabitants are connected to sewers at present). For the moment, filtering barrages stop solid waste, and upstream basins reduce sewage pollution by biological means, until the fish can return and carry out their scavenging work. In this way, all rivers are given a reserved area and natural protection. Relief from taxation has been promised for all areas which still contain portions of the primitive forest. Many such areas have been declared.

Density

High-rise buildings have been authorized only along two perpendicular routes, at a short distance from the bus stops. The result is strange; from a distance the town has an extraordinary appearance, because all the rest of the town is very low, but in fact it works very smoothly.

Refuse

Twenty years ago it was suddenly discovered that waste-disposal sites were full. Since new sites were anti-ecological and an incinerator would be polluting and too expensive, it was necessary to invent a slogan: 'Waste which is not waste'. Immediately the waste was recycled in exemplary fashion. After a few appearances on television, Lerner succeeded in persuading everyone to sort their waste by hand for selective collection; 40 per cent of the waste can be recycled (50kg of recycled paper avoids the need to cut down a tree, and Curitiba saves a thousand trees per day). Organic waste is put to one side and used as manure. This is a way of earning money. Three-quarters of the population are truly interested.

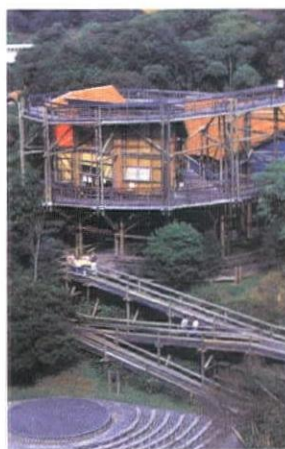
The waste is carried to a factory outside the town and is sorted for sale. The people working the sorting conveyors or bringing waste in are often very poor, alcoholics or homeless.

Economics

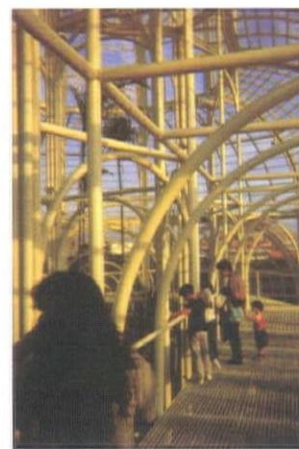
Such improvements have to be paid for, without agriculture or agro-industries. The municipality decided to set up an industrial city, not in the form of a specialized area but as an extension of the town, inside a natural park. Some old industries were still polluting the centre of town. They have sold their premises and have set up other installations, this time non-polluting, in new areas especially designed for them. These are not all reserved for industry, but contain a mixture of accommodation, enclosures, services, and recreational areas, and are equipped with a good system of internal and external transport. It is a '60s dream which has rarely been realized.



7



8



9

Time for travelling to work is minimal, either because people live in green town development or because they have a special line connecting them to the main working area remaining in the city. To start the economic mechanism, it was necessary to provide financial incentives to foreign industries to set up there, since local firms had refused to take the risk.

The Industrial City at present provides 50 000 direct jobs and 150 000 indirect jobs. Workers benefit from the quality of the surroundings, the excellent transport system, and the health, education and food services. On average, they spend three hours a day less in travel, than the same workers at Sao Paulo.

Social conditions and culture

Curitiba was swollen by refugees from the country. The supply of accommodation had difficulty in keeping up. There is still a shortage of 80 000 homes and 7.5 per cent of inhabitants are in temporary accommodation and nearly 5000 homes are being built per year. Although the mayor insists on high quality accommodation, he encourages do-it-yourself; it is often much cheaper than hastily-built barracks and is more suitable.

The quality of opportunity is greater than elsewhere in Brazil. For example the illiteracy rate is 7 per cent compared with 26 per cent in the country. Failure at school is also less. Vocational training, very difficult to finance, is given in disused buses. They travel from one district to another and teach all trades requested.

Beyond the immediate, functional prospects of people, numbers and needs, Curitiba regards culture mainly in relation to the inhabitants of a district or town, and saving travel time to work so as to provide longer periods at home or in other pursuits. Improvement of everyday life proceeds by a system of neighbourhood relations, on the scale of a village rather than a large town. This attachment to a locality provides Curitiba with an identity and multiplies the effects of one action on another.

The memory of the efforts of 20 years ago to construct a town of make-do and ecology is the stuff of today's personal history of the inhabitants and continues across the generations. The inhabitants have the feeling of participating in a novel ecological operation and of giving an example to the world.

Keeping the balance

Restoration of the town is the concern at all levels but is mainly discussed at the top. Lerner thinks that the town authorities should know how to balance the two vital elements – necessity and possi-

bility. A part of his day is devoted to dealing with particular requests, from maintenance of public lighting to ensuring that buses are punctual.

The other part of his time is spent in reflecting on what will happen in the town of the future after he retires. How many inhabitants will there be in 20 years? Where and how will they live? How will they go to work? Where will they throw their rubbish? Lerner says that 'The mayor who limits himself to current problems fails the city of tomorrow, whereas a mere visionary stumbles in all the ruts of today'.

Encouraging town spirit

Lerner maintains that town spirit is immaterial but a great incitement to action. 'We must escape the syndrome of tragedy' he says. The bomb promised by Malthus has not yet exploded. Poverty is widespread but does not overwhelm us. 'A tendency is not a destiny' says Lerner, echoing the philosopher René Dubos. 'The idea', he says, 'is that the citizens know that solutions exist'. The only way is to involve the citizens in improving their own environment. Recycling of rubbish and planting of trees are successes because they are organized in association between the official town and the private sphere.'

'The dream of a better town lives firstly in the heads of people' is another of his sayings. All the mayor has to do is to draw strength from these dreams. What he can do is limited by his electors. Strangely, Lerner has invented nothing; no action of his is a critical discovery. His genius was to undertake everything at once and co-ordinate activity over a long, continuous period. It is a truly architectural work.

Curitiba created and set up Unilivre, the Open University for the Environment, which trains professionals and citizens, teachers, educationalists, administrators and official managers of property, concierges and police. It was instituted in an old quarry in a park.

Curitiba is today regarded as the world ecological capital, but is strangely little known in Europe, particularly among those whose ecology is somewhat literary.

This text was inspired by an article by Mac Margolis (World Monitor) and by the booklet published by the municipality. Translation by Francis Humphries. The article was first published in French in the Belgian magazine A+, 1, 1999.

Curitiba can be contacted on e-mail: unilivre@bsi.com.br
Internet site: <http://www.bsi.com.br/unilivre>

All photographs from the city of Curitiba apart from 6 and 9 which are by Lucien Kroll.

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books

The age of simulation

VERTIGO: THE STRANGE NEW WORLD OF THE CONTEMPORARY CITY

Edited by Rowan Moore. London:
Laurence King Publishing. 1999. £30
(£19.95 at exhibition)

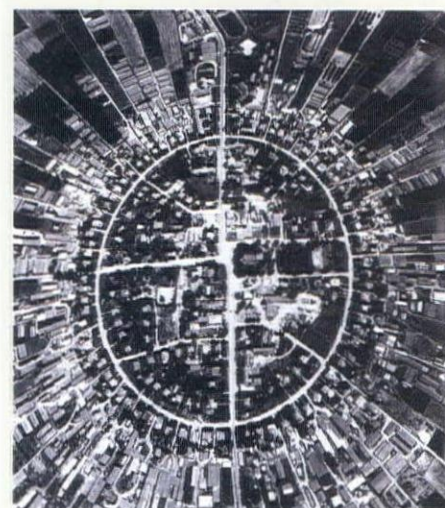
This is a book (and an exhibition, which closes soon) about simulation, about places pretending to be other places and the disorientation that comes 'when the certainties on which we stand are blown away'. Rowan Moore's excellent long introduction takes us on a round the world sight-seeing trip to all the most exotic and extreme examples of the phenomenon. We gawp like the tourists we've all become at the 'Venice in the desert' of Lake Las Vegas before zooming off to see the Windows on the World theme park in Shenzhen, and the Las Vegas-inspired Sunway Lagoon in Kuala Lumpur – a simulation of a simulation with Malaysian flavour additives. But it isn't all theme parks, casinos and shopping malls. The skyscrapers of Shenzhen itself are crude copies of originals by the likes of Foster, Pelli and Eisenman, and housing schemes like Disney's Celebration in Florida or the Prince of Wales's Poundbury estate in Dorset are simulations of real communities that may once have existed, though perhaps only as film sets.

Faced with all this architecture that isn't quite architecture, 'real' architects are put in an awkward position. How can they give lasting form to social realities when daily life is dominated by the fleeting fantasies of film, television and advertising?

According to Moore, the best architects – Gehry, Ito, Koolhaas, Nouvel, Herzog and de Meuron – perform a kind of balancing act, making virtues of the qualities of this strange new world, 'its weird shifts of scale, its juxtapositions of the local and the global, the physical and the immaterial, its odd misapplications of imagery', without falling into the abyss of out and out consumerism. Perhaps this is why most of the following chapters are about real architecture – Foster's Chek Lap Kok airport, Libeskind's Jewish Museum, Herzog & de Meuron's Tate Gallery and Latz & Partner's poetic conversion of an abandoned steelworks in Duisberg to a public park. The message seems to be that we can't go on simulating for ever or we will run out of things to simulate. But will we? Hasn't architecture always been a simulation game? What is a Greek temple, after all, but a marble simulation of a wooden original?

COLIN DAVIES

The exhibition runs until 16 May at The Old Fruitmarket, Albion St, Glasgow.



Nahalal, Israel from Spiro Kostof's outstanding *The City Shaped: Urban Patterns and Meanings through History*, which has now been re-issued by Thames and Hudson, London as a paperback at a very reasonable £18.95. While some of the meanings may be questioned, the imagery remains stunning. The historical sweep is dramatic and the geographical range, if not totally comprehensive, is by far the best in a work of this length.

Space in the home

DECODING HOMES AND HOUSES

By Julienne Hanson. Cambridge: Cambridge University Press. 1998. £45

The 'space syntax' developed by Bill Hillier and Julienne Hanson provided a quite new way of looking at buildings and city spaces: it defined numerically quantifiable relationships between spaces and people which, paradoxically, could broaden the subjective appreciation of a space. It enabled a tightened political interpretation to the historic organization of rooms and routes, and appeared to provide an anchor to one's intuitive criticism of a place. In large doses, however, their method can have the dotty, obsessive quality of an introspective cult: a lot of words and numbers which do not essentially mean anything. And that is sadly the predominant impression of this book, because the typical house is too small and its internal and external spaces too delicately defined for space syntax to work in any valuable way.

There is much interesting information here, and the chapter on the gentrification of working class housing has some engaging observations, but so much is subjective or conventional that one wonders what the mathematics actually contribute. As Hanson remarks in concluding her chapter on tradition and change in the English house (which sadly excludes Baillie Scott, a true space pioneer): 'It all depends on how you look at it'. Enough said.

TIMOTHY BRITAIN-CATLIN

Where there's no there

SLOW SPACE

By Michael Bell and Sze Tsung Leong.
New York: Monacelli Press. 1999. £25

Many commentators don't like this book's intended topic: the allegedly formless aspects of American cities and their peripheries, the expanses of parking lots, discount sheds, malls, and so on. But they think they should. They see it is the way things are going. They do not want to be associated with the alternative, the cinnamon-flavoured toytown of the New Urbanism. And they feel that hyper-sprawl, interpreted correctly could represent not only the nonsense, moving-on impulse of the American spirit but – a double attraction – the decentred subjectivity of the post-human condition.

Slow Space comprises 20 or so essays. Its editors claim that 'immanent' in each text is 'a transformed subject enmeshed in the ecologies of urban assemblages'. Aaron Betsky certainly contributes an astute and well-informed survey of the attitudes struck by various observers towards 'edge city' and its relatives. But most contributors wander freely off the editorial track. Among the most thought-provoking and readable are Dana Cuff on the terms in which public rights join debate with private property rights, Hubert L. Dreyfus on Heidegger's attitude to technology, Elizabeth Burns Gamard on Schwitters' Merzbau and Fares el-Dahdah on a haunting (and haunted) exhibition in the war-scarred ruins of the Beirut National Museum.

Herd together a score of texts on 'contemporary architectural discourse', mostly by academics, and you can bet that some will be written in Heavy American. Sure enough, on the book's second page, the editors, wanting to make the commonplace (perhaps too commonplace) observation that 'capital now flows internationally', write instead that 'the liquidity of capital [has] long ceased correlating itself to cartographic delineations'. Later a writer admires a photograph of a mullion. He notes that the photo is over-exposed – or, as he puts it, 'the haptic qualities of matter emerge in a postvisual field of optic dissolve'. He also notes that the mullion, made of stacked bars, looks as if it might fall over – or rather, 'Form's quantitative outline is undermined by the immanence of a structural failure induced by gravity's incessant pull ... The stacking instigate[s] an unnerving vertical instability. A simple lateral push of the slightest magnitude would disable the design ... The bars have a formal immanence towards toppling'. One gets the immanent point, but the verbal millstone grinds on laboriously. This makes *Slow Space* an often sluggish read.

The reason for this creaking gravity is that *Slow Space* takes itself very seriously. Wit or intellectual sparkle – still less humour or self-deprecation – are *streng verboten*. One suspects that for some of the writers, normal diction seems not elevated enough to match the imperial pretensions of Architectural Theory. The grander the claims, though, the greater the disillusion when they cannot be fulfilled: one contributor congratulates architectural theory for 'brilliantly' exploring 'gender oppression and the mind/body distinction' (no less) but finds it 'obscene' that 'even after years of deconstruction' it has failed to 'participate in the struggle against HIV'. He doesn't suggest how architectural thinking on the disease might improve matters, but clearly thinks it should.

Those tempted to buy the book just for its come-and-get-me title, to find out how space can be 'slow', should save their money. The introductory essay hints vaguely that, in the context of the modern city, 'fast space' is manifest in local, abrupt changes arising from individual profit-motivated decisions, while 'slow space' concerns longer-term cumulative transformation. But 'slow space' then disappears until, on the book's next to last page, it makes a mercifully fast farewell appearance. PHILIP TABOR

Eternal city of the imagination

THE ARCHITECTURE OF ROME

Edited by Stefan Grundmann. Stuttgart:
Edition Axel Menges. 1998. DM68 (£28)

This, the latest product of the long German love affair with Rome, revealingly carries an epigraph from Goethe's wonderful *Italian Journey*: 'No one who has not been here can have any conception of what an education Rome is'. If you cannot go to Rome, this book will help take you there in the imagination. But your mental trip will be highly organized, and sometimes rather difficult. The 400 buildings described are rigorously listed chronologically, starting with the Forum Romanum and ending with the Nuovo Stadio Olimpico (finished in 1990). History is divided into epochs: Antiquity, Middle Ages and so on, with a useful historical introduction to set the scene for each section.

But there are problems with this approach, in that if you don't know the sites, it is difficult to relate adjacent pieces of cityscape in the mind: for instance SS Trinità dei Monti and the Spanish Steps are described in quite different places (the church being a century and a half before the steps). So one of the most dramatic and picturesque moments in the whole city has been carved up in space and time and made, I suspect, incomprehensible to people who have never seen the splendid sequence from the Piazza di Spagna with its Bernini

boat-fountain to the twin-towered French church on the top of the hill. In some cases, buildings are pulled to bits: S. Maria Maggiore, for instance, has at least four separate entries scattered through the book.

The descriptions of individual buildings by a distinguished team of scholars are thorough, thoughtful and usually illustrated. All the great buildings are there – for instance buildings as different as the Pantheon, Bramante's Tempietto, Borromini's S. Carlo alle Quattro Fontane, and that heroic icon of '50s Modernism, the railway station are explained with sympathy and copious factual analysis: historical, structural and aesthetic. Occasionally there are judgements to quarrel with – how on earth can Grundmann suggest that Hadrian's Villa 'is not eclectic at all' when it was created with themes from all over the Empire to remind the ruler of his favourite far-flung places?

As the inclusion of the Villa indicates, the geographical range is as wide as the historical one. From Ancient times, Ostia, the old port, is there – as is the temple of Fortuna Primigenia at Palestrina, much to the east of the city. All the famous Renaissance villas, to which the aristocracy retreated when the city became too hot in summer, are visited.

The book may have problems, but surely no-one who loves architecture will want to be without it when next visiting the eternal city. P.D.

Modern survivor

THE DESSAU BAUHAUS BUILDING 1926-1999

Edited by Margret Kentgens-Craig.
Basel: Birkhäuser. 1998. DM98.

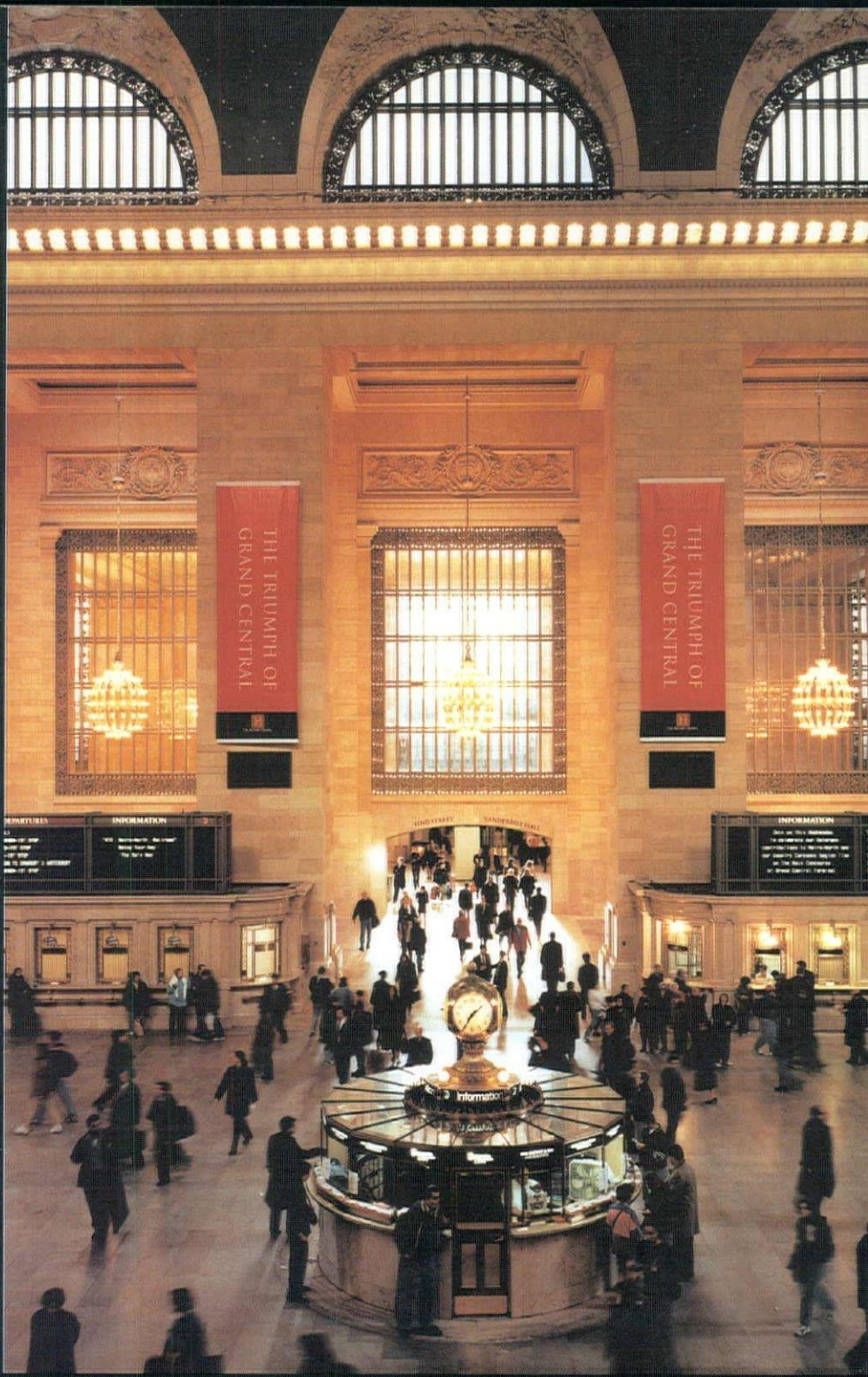
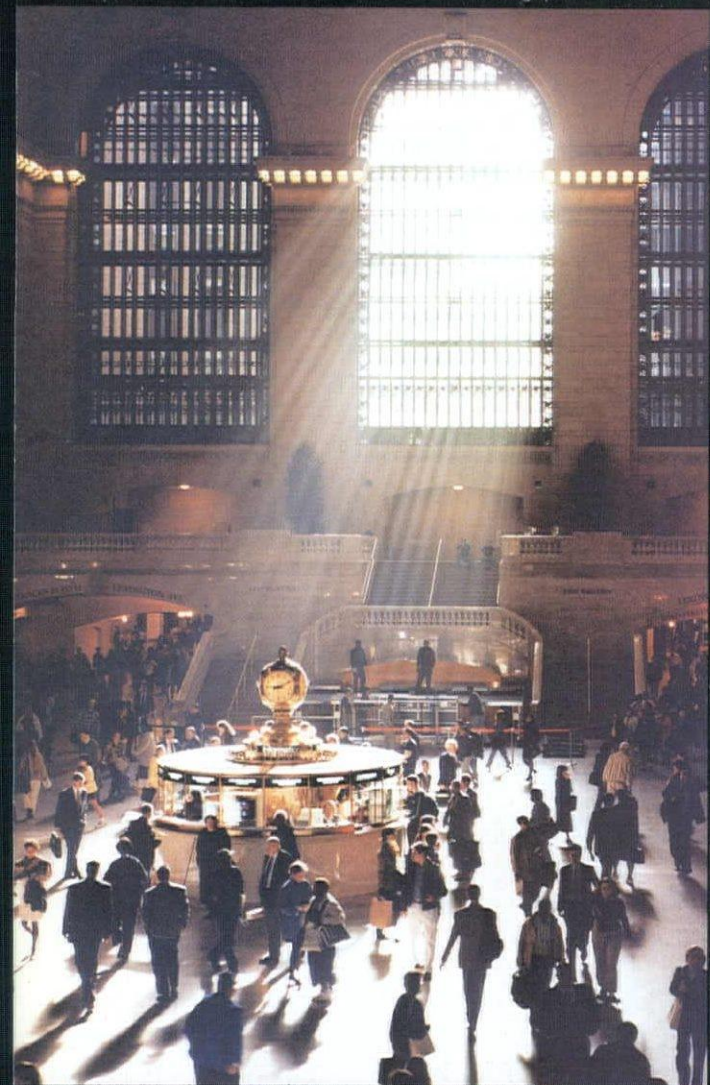
Forty years ago there were three acknowledged masters of Modern Architecture – Le Corbusier, Mies van der Rohe and Walter Gropius. Corb's star has remained high, Mies sank for a while and is now coming back, Gropius's reputation dived and has never recovered.

Yet Gropius's own house at Cambridge and the Bauhaus at Dessau are quite clearly masterpieces, and he was client and joint architect for both. The fact that Gropius and his colleagues built third-rate buildings towards the end of their lives should not reduce our admiration for his best architectural work.

This book, by numerous authors, is a timely reminder of the magic of the Bauhaus building. It tells and illustrates the story of the place over time. Designed in 1925, it was the first great Modern building. It suffered humiliation under Nazis and Communists, interspersed with periodic attempts to restore it. It has been vilified, bombed and burnt. But it is still there, more wonderful than ever. In spite of sloppy editing, this book tells the story well. JOHN WINTER

DELIGHT

Photographs: Peter Aaron/Esto



FOLLOWING ITS MAGNIFICENT REJUVENATION, GRAND CENTRAL STATION (THE PREMIER AMERICAN RAILWAY TERMINAL) AGAIN LIVES UP TO ITS MYTHIC REPUTATION AS THE MOST IMPORTANT SPACE IN ALL MANHATTAN.

New York City has regained its heart and soul with the revitalization of Grand Central Terminal, the premier railroad station of America. Almost lost, like the fabled Pennsylvania Station, until its listed status was secured in 1978 against a proposed skyscraper by Marcel Breuer, Grand Central has survived in a more enlightened and pristine form than even its original. After trains were electrified in the 1890s, romantic glass sheds to dissipate steam gave way to monumental civic spaces for the procession and movement of people. Grand Central's main concourse in the Beaux-Arts style, designed by Whitney Warren in 1913, serves half a million travellers and pedestrians a day as a cosmopolitan town common.

For John Belle of the Terminal's restoration architects, Beyer Blinder Belle, the turning point came in 1990 when the Kodak billboard blocking the high arched windows was removed and the sun poured in on startled morning commuters. By stripping away tawdry

additions and widening ramps from the street and down to the lower train platforms and new restaurant area, the architects have established an orderly, axial flow. Shopping arcades located beyond the main concourse are lined with bow-windowed stores reminiscent of John Belle's native Cardiff. Abandoned marble quarries in Tennessee were reopened to repair columns and construct a second horseshoe staircase, in completion of the 1913 symmetrical plan.

The crowning moment comes on any ordinary day as one descends the original Garnier-style grand staircase into the majestic space. Suspended between the barrel-vaulted sky ceiling above (a blue-green firmament with gilded constellations and fibre-optic stars) and the muted din of the crowds below, one pauses in anticipation and then plunges into the charmed and dramatic world of travel. Thank heavens Grand Central did not become another museum.

PAULA DIETZ