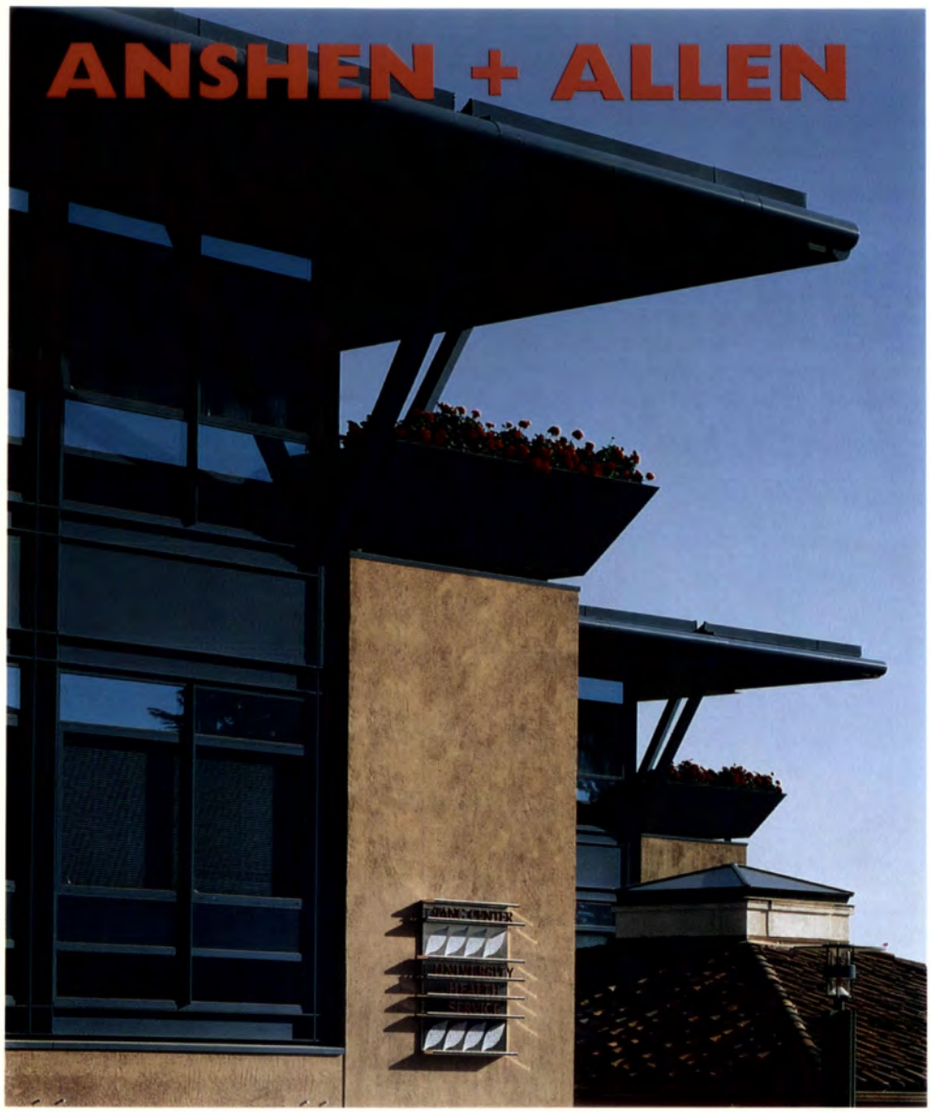
WORLD ARCHITECTURE

ISSUE NO. 48, JULY/AUGUST 1996 US$14.95 UK£10



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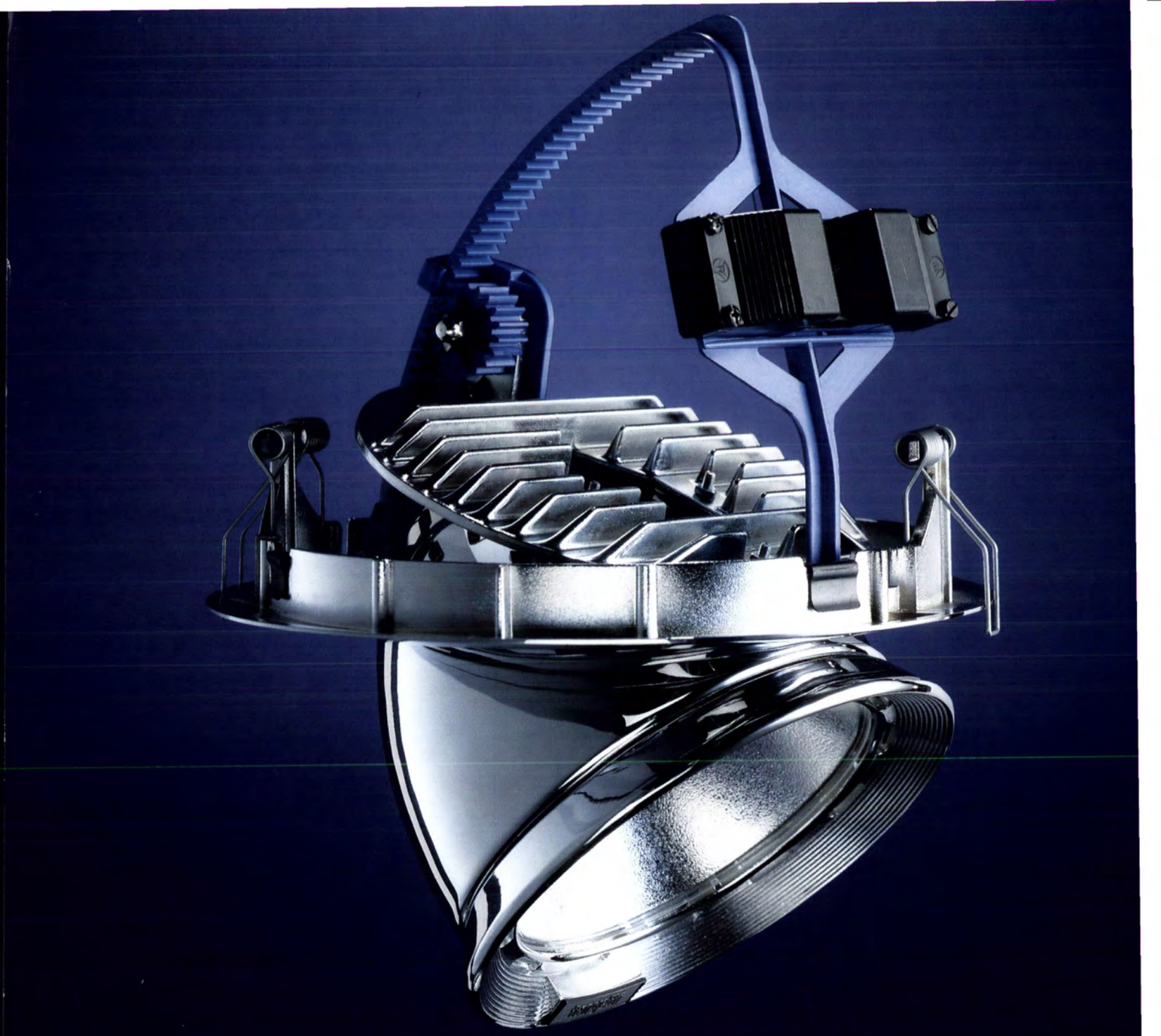

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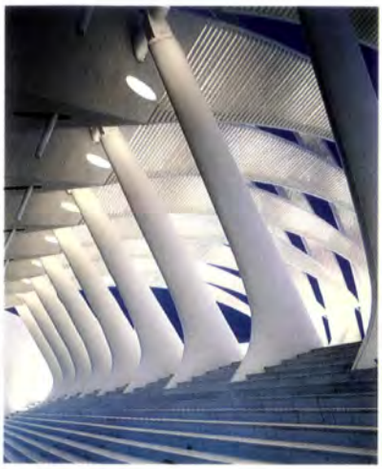

Kuwait Pavilion, Expo 92 by Santiago Calatrava. Photo John Edward Linden

Arcaid page 102

The Hotel Salto Chico, Chile. Photo Guy Wenborne

Chile country report page 34

Brisbane International Airport by Bligh Voller Architects

Transportation special report page 110

Renovation of the Haiger Municipal Hall

2250m² of stainless steel strip provides impermeability that lasts

Klaus B. Maier

On the A45 autobahn, south of Siegen, is the exit to Haiger-Burbach. Less than 60 minutes drive from the big cities of the Rhine-Main and Rhine-Ruhr areas, located in the geographical centre of the old Federal Republic of Germany, is the old town of Haiger, which is typical for its framework construction.

The 1,200 year-old town has a colourful history. One of its principal attractions is the Church of Haiger. Built in 1408, the church is notable for the magnificent paintings in its choir hall. Next to the church is a three-storey building, a lovingly restored framework construction. Today it houses the museum of local history (above).

The seventies-style town hall and municipal hall, as well as the activities of the 19,000 inhabitants demonstrate the cultural diversity of Haiger.

The renovation work

The municipal hall of Haiger was inaugurated on 10 January, 1974. The exterior (picture 1) is a strictly delineated construction, broken up by glass windows and faced with natural stone. The building has a flat roof, which is poorly insulated. When exposed to extreme conditions over a number of years – such as the presence of 600 people – the concentrations of vapour produced, as opposed to the periods in-between functions when humidity remains normal, causes the roof to leak. The NIROSTA® Metal Roof System by ESTA* – based in nearby Wilmsdorf – was chosen as the most appropriate solution to the problem given that the existing roof could be conserved and used as the substructure. The only requirement was the removal of the old gravel layer.

Once cleared the roof was ready for the laying of a sloping insulation covering – the slope was achieved by laying insulation slabs of different thicknesses. Walk-on type rock wool insulating slabs were overlaid (picture 2). Contractors, Kentzler made the decision to utilise this slope solution in order to enable swift rain removal via round drains of 100 millimetre in diameter (picture 3). Due to the existing parapet walls, the use of gutters was superfluous (picture 4). The roll seam welding of the stainless steel ensures that the stainless steel roofing system is absolutely water-tight, even on 0-degree roofs.

The handling

Stainless steel strips are usually supplied with a width of 625 millimetres x 0.4 millimetres in thickness, on coils of approximately 200kg. For the Haiger municipal hall renovation 1,200 millimetre wide coils were used (pictures 5/6). The roll-seam welded sheets has to be loaded with gravel, which counteract wind suction loads, thus bypassing the need to use cleats. In order to protect the roof cover from wind-action, prior to the application of the gravel, barrels of water were distributed at premeditated intervals on the roof (picture 7).

On site, the coils were cut to the required sheet lengths and the long seam edges were folded vertically to a depth of 28 millimetres. In the folds, approximately 18 millimetres from the surface, the two sheets were joined using special roll seam welding machines. By the subsequent unilateral folding down of the welded seem through 180° minor welding distortions are compensated and a heavy duty lock seam is created – this procedure does not contribute to the water tightness of the roof cover.

Testing

ESTA-Gesellschaft fur Edelstahlverarbeitung mbH is the owner of the quality seal for the NIROSTA® Metal Roof System. The seal comes with a 10-year guarantee – to a maximum of DM2,000,000. If between the eleventh and thirtieth year, after installation, damage is caused by the corrosion of material, re-installation is provided free of charge. This warranty extends beyond the existence of the original installing company. Membership of the Association of Quality Seal is obligatory for all installation companies, in the interests of the client.

On completion of the renovation work at Haiger Municipal Hall a water-tightness check was carried out by the TUV (Technical Checking Organisation), Nordrheim-Westfalen. This test involved flushing-out the stainless steel roof installation, from below, with helium (pictures 8 - 11). The helium will pass through any unsealed joint due to its low density. For this procedure the TUV have developed a U-shaped plexiglas probe, which fits over the joint. In this instance the tests proved satisfactory, despite the numerous complicated claddings of air shafts, water drains and light domes (pictures 12 and 13).

Conclusion

The highly corrosion-resistant stainless steel, combined with roll seam welding, provides a roof of almost unlimited life expectancy. Even entirely flat roofs can become entirely water-proof using this system. The NIROSTA® metal roof system requires no modification to the existing structure. The existing roof construction, with the exception of the gravel, can be preserved in its entirety, thereby avoiding the problem of waste disposal.

Both ESTA and Kentzler believe that the renovated roof of Haiger Municipal Hall is now water-tight and will survive the ravages of time.

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Project data:

Client	The town of Haiger
Constructor	Kentzler, D - 44145,Dortmund, Germany
Roof surface to be redeveloped	2250 square metres
Sub-structure	Single sheet flat roof with heat insulation

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Opposite page

Haiger Church, built 1408. The town museum can be seen in the foreground

This page

1 *The Municipal Hall, built 1973*

2 *For the swift drainage of water polystyrene sheets were applied to the faulty flat roof. Walk-on rock-wool insulation sheets were overlaid*

3 *Rainwater is quickly drained by circular drainage pipes, 100 mm in diameter*

4 *The parapet walls limit the roof surface,meaning that gutters cannot be installed. Also shown are the stainless steel strips that replaced the gravel*

5 *Partial view of the municipal hall with hoist*

6 *1200mm wide coils supplied to the site. Pictured in the foreground are folded cleats for the cladding of the parapet walls*

7 *The stainless steel sheets are held down by 50 litre water barrels. A layer of gravel will provide storm protection at a later date*

8 *Preparations for the Nordrheim-Westfalischen test*

9 *The stainless steel roof surface flushed from below with helium*

10 *The TUV test equipment with its sniffing probe*

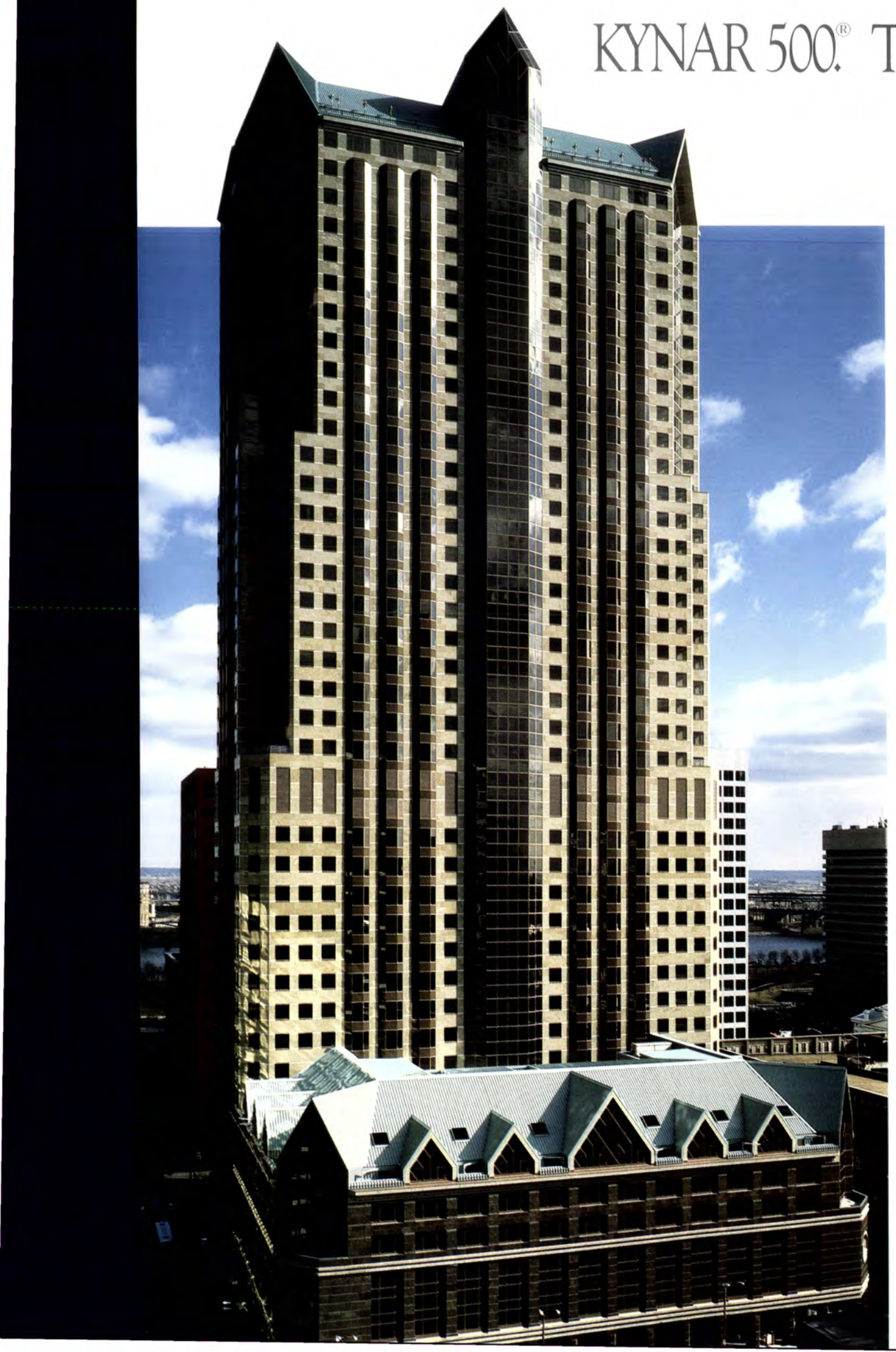
11 *The true tightness of the folds can be established with the aid of special devices*

12 *Special care was necessary to realise the expert cladding of the elements that penetrated the roof*

13 *Light domes, air shafts and water inlets projecting from the existing roof structure*

13

KYNAR 500® The Original.



Gyo Obata On Originality

Gyo Obata, FAIA

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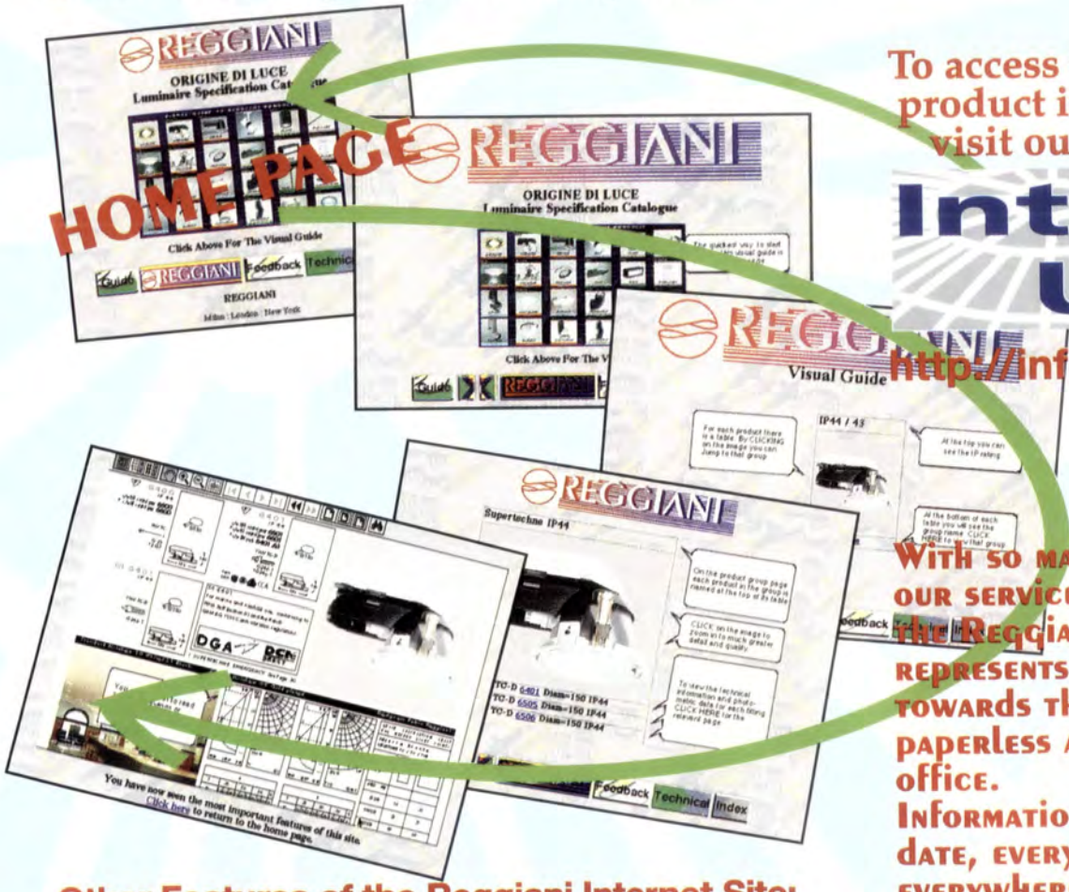

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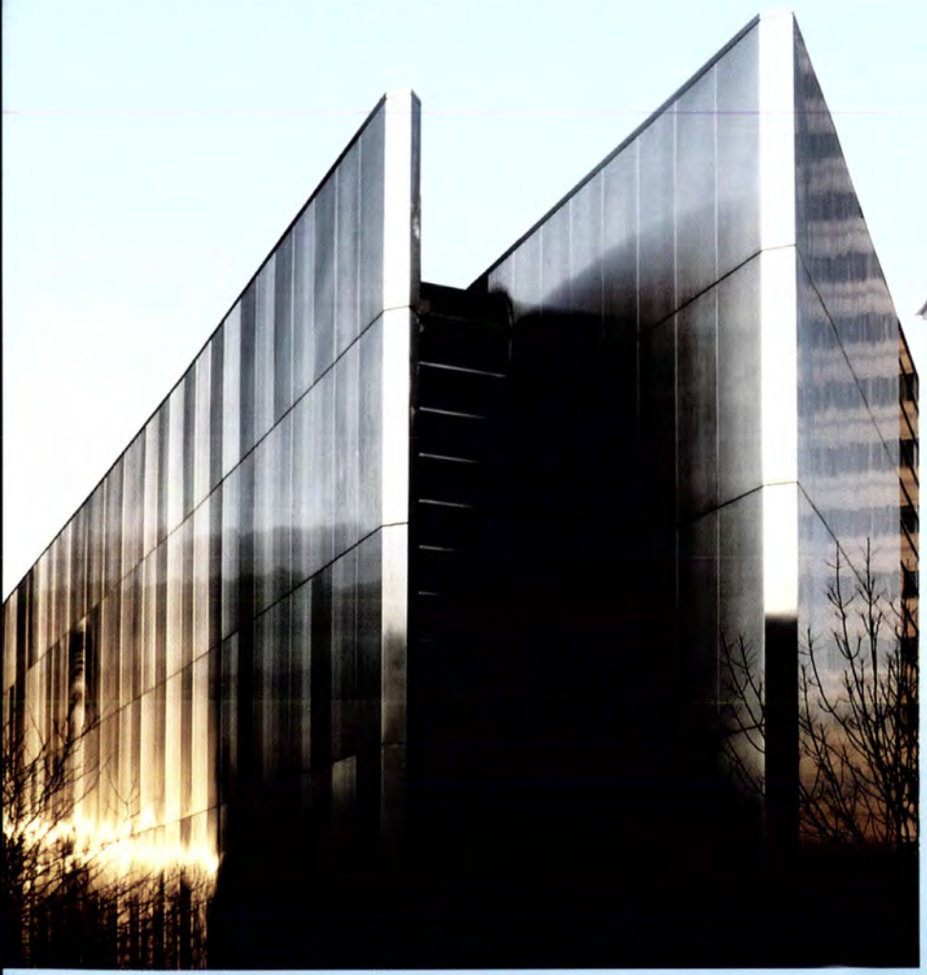

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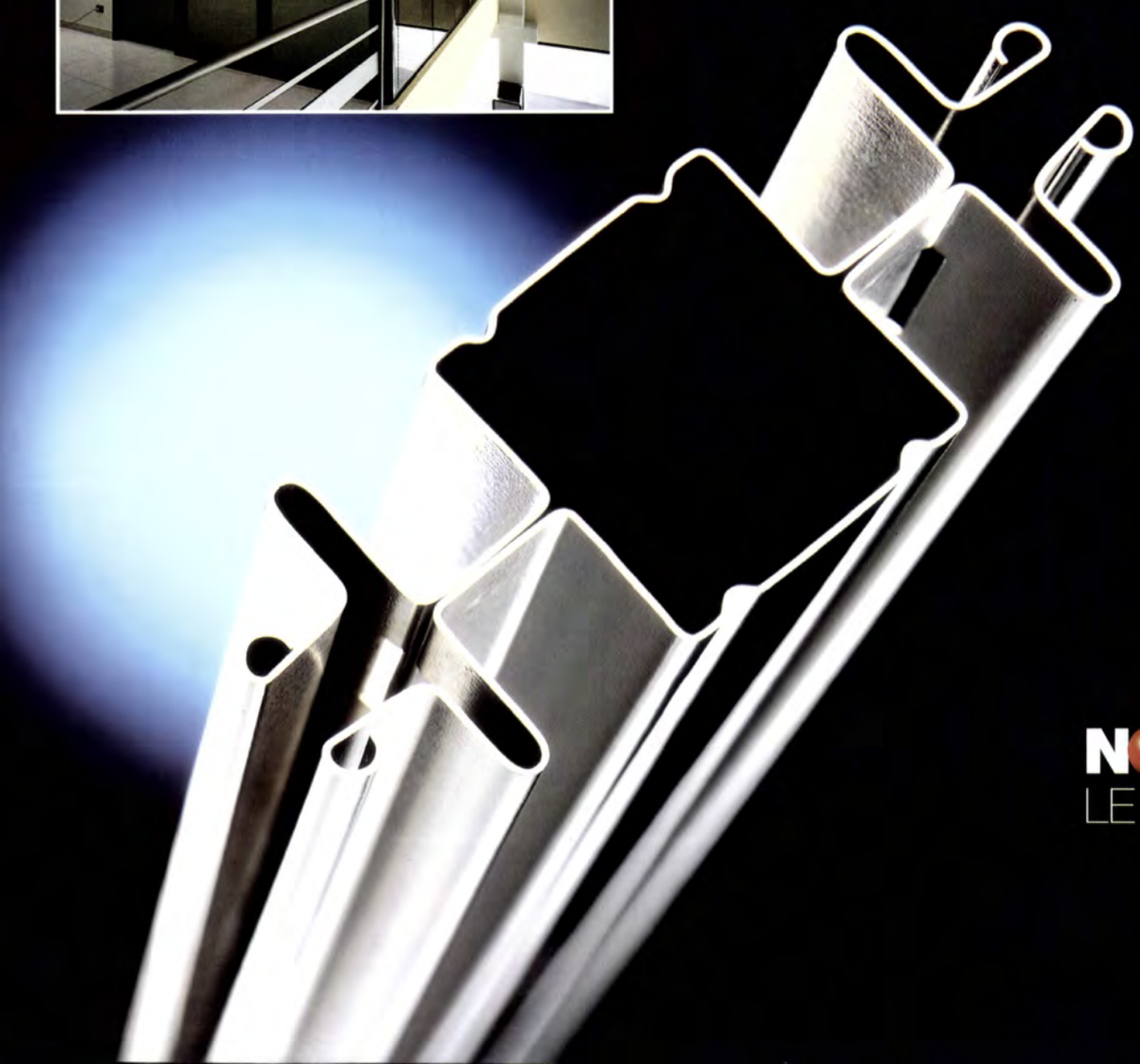

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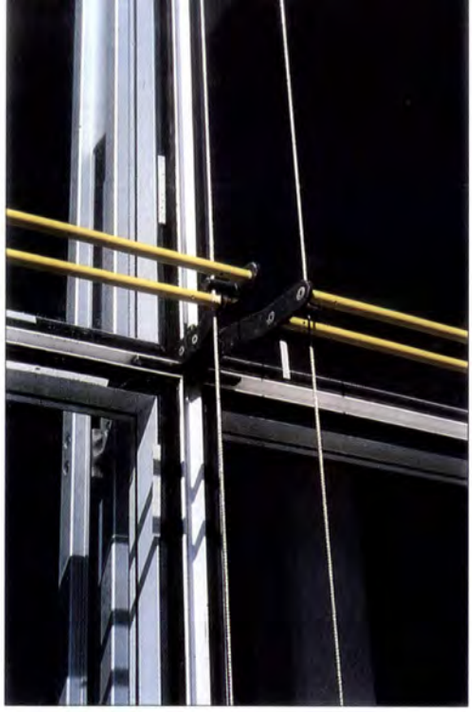
Focchi SpA
at Lingotto

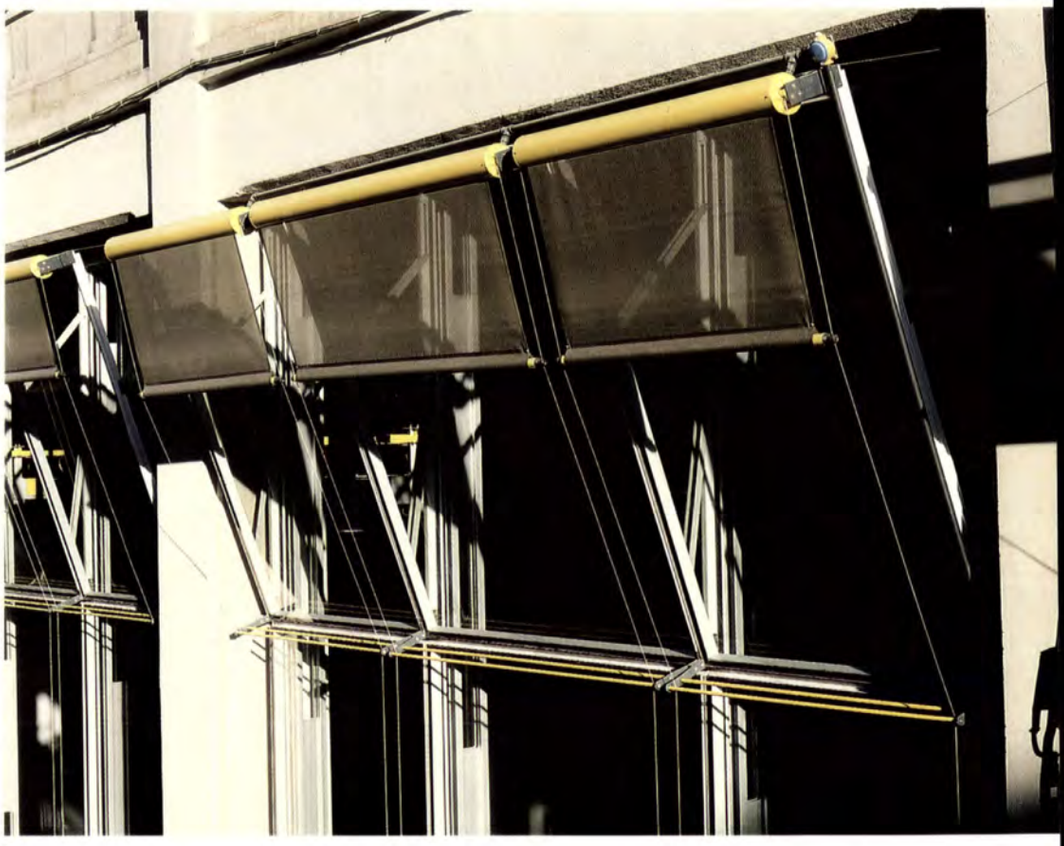
The former Lingotto Fiat factory in Turin was designed in 1916 by the engineer Giacomo Matté Trucco and is an extraordinary example of industrial architecture. At the time, the building was seen as a symbol of the modern movement in Italy and continued in use for nearly sixty years until closure in 1982.

The following year, Fiat commissioned Renzo Piano Building Workshop to undertake a study for new uses for the building and three years later, refurbishment began to convert the complex into a modern centre for business and the arts. The overall intention is to make Lingotto part of the City of Turin and as a result, the new multi purpose centre will not only provide business and conference facilities, an exhibition centre and hotel but also shopping and residential areas, restaurants and a leisure centre, all set amidst landscaped gardens and a park.

Due to the size of the complex – some 500 metres in length – the conversion is taking place in various stages, with each section becoming fully functional on completion. The first phase to be completed is the Centro Fiere, a new centre for trade fairs housed in Pavilion No. 5 in the original complex and a new and larger exhibition hall to the south. The initial glazing contract for the refurbishment of the windows in Pavilion No. 5 was awarded to Focchi SpA, a specialist company based in Rimini. Recognising that the



Opposite page top *The glazing, at ground floor level, of Pavilion No. 5 with motor assisted top opening panes.* ***Opposite page bottom left and right*** *Full height glazing at the Exhibition Centre gives visitors an unobstructed view of the interior.* ***Left*** *Detail of window construction.* ***Below*** *Open windows at Pavilion No. 5 with colourful solar controlled blinds.* ***Bottom*** *Detail of custom made aluminium structural mullions at the Exhibition Centre*



repetitiveness of the window frames were a main feature of the facade, but wishing to provide a contemporary energy efficient interior, Piano decided to replace the existing element with new double glazing and solar controlled screening. Focchi worked with Piano to match the original design using a custom made solution of extruded aluminium and toughened and float glass. The windows on the four upper floors each have 40 panes made up of 5mm float glass and 4mm toughened glass with a 9mm air gap between. As with the original structure, some windows can be opened but all have now been fitted with solar controlled blinds which adjust automatically to suit the weather conditions and the level of light. At ground floor level, the top panes of the glazing are hinged from the bottom and motor assisted for opening.

In 1991, the contract for the full height glazing of the adjacent Exhibition Centre was again awarded to Focchi. This section of the scheme required a transparent, flush facade, designed to provide visitors with a clear and unobstructed view of the "inside life" of the building. Focchi has achieved this using custom made aluminium structural mullions to provide glazing of an exceptional height – 12 metres without intermediate supports. The system comprises a series of outer panes of 12mm toughened glass, each measuring 2.4 metres x 3.6 metres, with an internal loadbearing structure composed of solid aluminium mullions. The connection between the glazing and the support system uses specially developed aluminium castings.

Focchi SpA was founded in 1914 by Giuseppe Focchi, who started manufacturing steel frames and decorative gates from a small workshop in Rimini, Italy. Today, the company are still based in the same area, operating from a headquarters and factory producing advanced curtain walling systems and architectural products. Four years ago Focchi Services became the holding company of the Focchi Group. Focchi Services offer professional assistance to clients. Focchi Giuseppe SpA was set up to research and develop products, innovative technology and manufacturing. The design team of more than 20 project managers and draughtsmen can offer design flexibility coupled with traditional skills, and use the latest computer technology, computer aided design and engineering analysis programmes.

Over the years, Focchi SpA has collaborated on many prestigious projects worldwide. Recently they have worked with Hans Hollein on Haas Haus, Vienna and Renzo Piano Building Workshop on Kansai International Airport, Osaka. Focchi's continuing input on the Lingotto project further endorses the company's commitment to design.

For copies of the Focchi SpA brochure or details of the mentioned project, please tick box 5 on the reader reply card.

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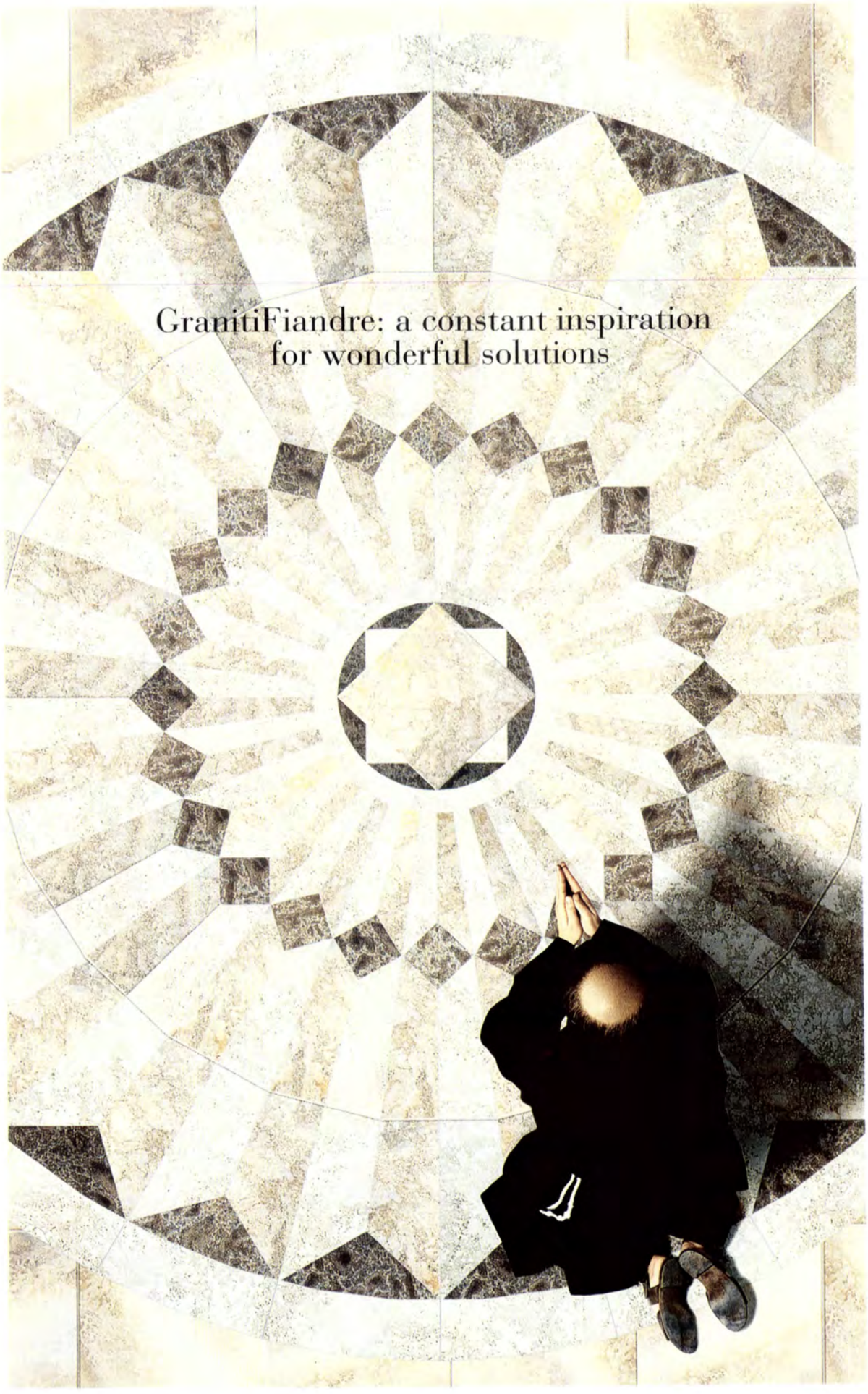

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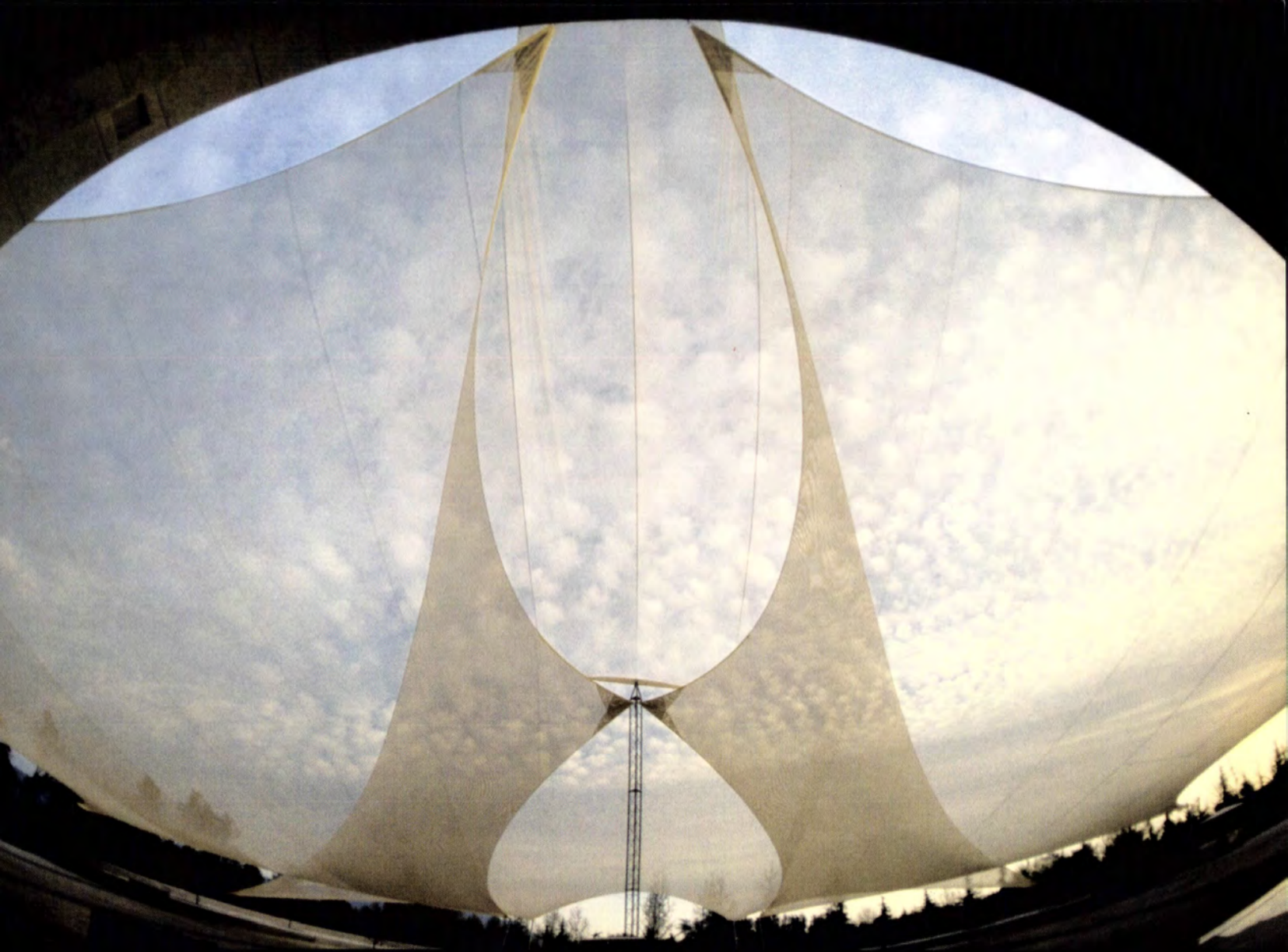

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Florence and the Renaissance

The glory of initiating this extremely important cultural movement – its name expressing the concept of rebirth and renewal of the arts and philosophy obvious to contemporaries and acknowledged by modern historians – belongs exclusively to Florence, its first centre, and Tuscany, which was dominated politically by the city. The fundamental stimulus for this vast reconstruction process was provided by the art, culture and philosophy of Ancient Greece and Rome, studied using the original texts which came from the Eastern Roman Empire after its fall. Classical literature and art, considered as examples of new inventions, offered renaissance culture a vital starting point for the construction of a new image of man, who appeared to break his links with the divine and the supernatural in order to claim his place at the centre of the universe, which reason is capable of understanding and exploring.

FIRENZE and other Pastorelli Ceramiche tile products have ben installed worldwide. Some recent projects are:
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The Intercontinental Hotel, Sharm el Sheik, Egypt
The Assembly Hall, Yangon, Burma
"La Residence" Hotel, Port Louis, Mauritius

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The Shwedagon Pagoda is located in the centre of the capital of Myanmar (formerly Burma), Yangon. The total height of the 2,500 year-old monument is 98 metres. Surrounded by 60 small pagodas, Shwedagon's roof is made up of 13,153 gold tiles, with a combined weight of 45 tonnes. For the Burmese population, as well as the Buddhist population world-wide, the Shwedagon Pagoda is considerd to be one of the principle landmarks of the Buddhist faith – it can be seen as the equivalent of the Vatican, Rome.

Pastorelli Ceramiche Spa – Italy, has recently been made the official supplier of ceramic tiles for the renovation of the Shwedagon Pagoda, by the government of Myanmar.

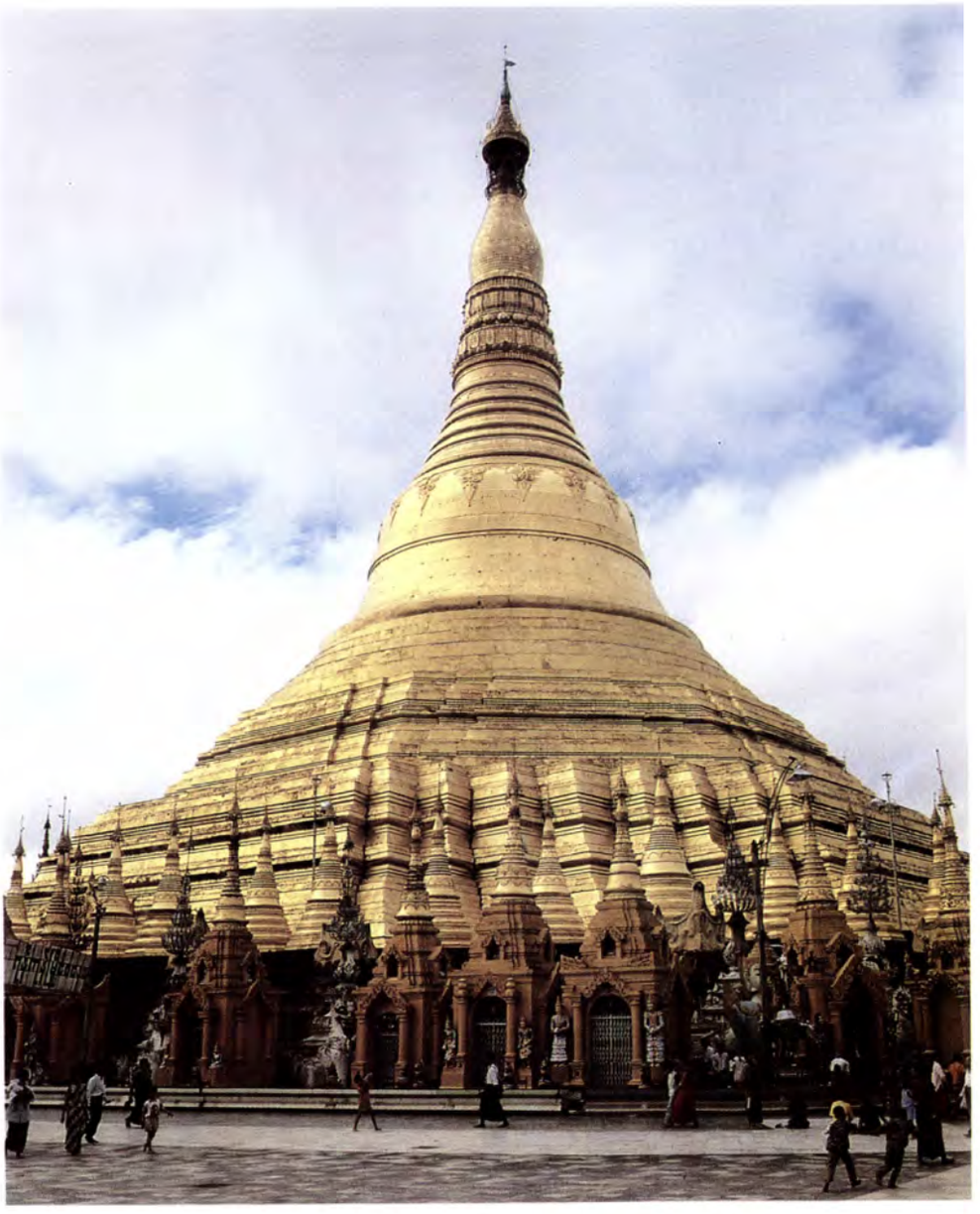
1996 has been declared "Year of the Tourist" in Myanmar. With this in mind the government has devoted much time and effort to the renovation of sacred places, hotels and airports, in anticipation of a thriving tourist season. At least 2,000,000 people are expected to visit Myanmar during 1996.

A principle concern of the government was the successful reparation of the marble floors and stairs of the world's largest pagoda. A unique characteristic of the project was that, by Buddhist rule, shoes may not be worn inside sacred areas. With summer temperatures reaching up to 42°c the project demanded a material that would not retain heat, would have a long life-cycle and would be easy to clean. Another concern was to find a neutral product that has similarities with the original stones of the ancient pagoda.

With all these considerations in mind the governmental committee, lead by local architect Mr. Win Maung, chose the homogenous porcelain tiles manufactured by Pastorelli Ceramiche Spa-Italy.

Technogres, the chosen tile, is similar to natural granite in its qualities of resistance to scratches and abrasion. The tiles are produced in kilns at temperatures of 1250°. They are frost proof, heat resistant and easy to install and maintain. Items used in the Shwedagon Pagoda are 30x30cm tiles ref. Ardesia, Granato, Bavenco, available in both polished and unpolished versions.

The project consisted of two distinct phases: four long stairways climbing the hill to the pagoda, and the sacred square surrounding it. The first phase comprised a total area of 25,000 square metres, which was to be completed by December 1995.



The second phase – the sacred area – is made up of 5.6 hectares – equivalent to 56,000 square metres, and is to be ready by mid-June 1996.

At the time of writing, the tiles used in the Shwedagon Pagoda are under consideration for use in renovation projects at the National Assemmbly Hall, another sacred pagoda in Mandalay, two large hotels in Yangon, and a hotel in the city of Bagan.

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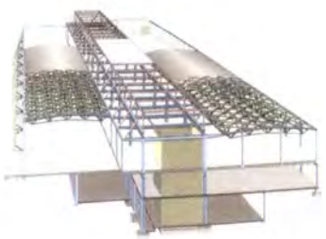

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Issue 6, June 1990

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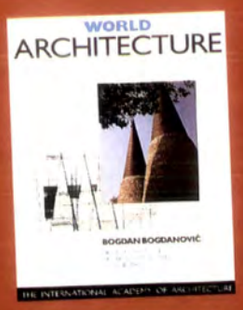

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THE GENIUS OF JEAN PROUVÉ
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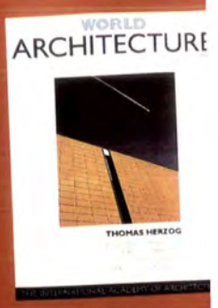

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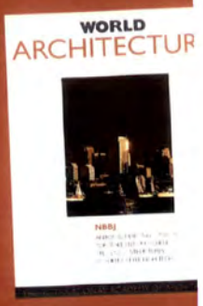

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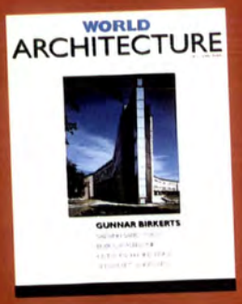

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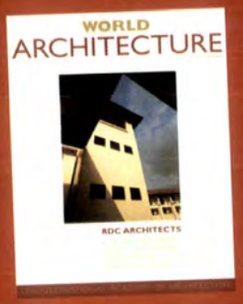

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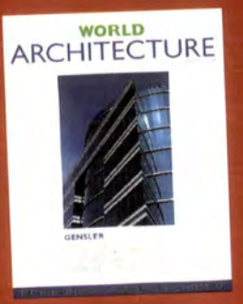

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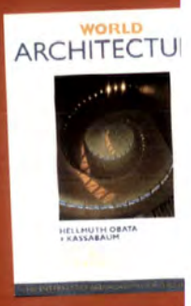
ENIGMA OF DYMAXION MAN



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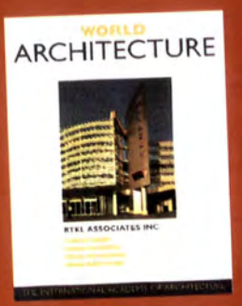

RTKL Associates Inc
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YANKS AT CARDIFF
HORDEN ON HOSPITAL
PÖSCHL AND BALDEWEG
DENNIS GILBERT IMAGES

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These are image conscious days

John Ruskin once said that "All architecture proposes an effect on the human mind, not merely a service to the human frame." The same could be said of architectural photography, whose function is not only to document a project, but to provoke an emotional response in the viewer, an abstract understanding of the building, its materials and site. For the last three years *World Architecture* has pioneered the publishing of renowned international architectural photographers in *Gallery*, from the clean lines of John Edward Linden *WA 29* and the black and white enigmatic prints of Hélène Binet *WA 30*, to the drama of Ian Glover's industrial essays *WA 32* and the teasing narrative of Martin Charles's abstract details *WA 33*.

The series was launched by the multi-talented Richard Bryant, an architect who set up the renowned international picture library and assignment photographic agency, Arcaid, based in London. In this issue we celebrate the diverse work of Arcaid, whose subject matter ranges from historic interiors and landscapes to the latest in contemporary urban buildings. It also marks the end of a chapter for *Gallery*, which will continue for the time being in the format of the previous two issues, as a "Free Print Offer", advertising the work of diverse photographers, with the offer of a free print as an incentive to new subscribers to *World Architecture*.

Photography has glamourised and popularised architecture over the years. Carefully composed images and dramatic distortions are the key to the coffee-table publishers' heart. City tour guides and promotional literature are littered with pictures of the city's landmarks and attractions – buildings as the most immediate and tangible indication of a community's urban culture and identity. Postcards are sent and received of familiar city icons such as the Eiffel Tower, IM Pei's Louvre pyramid, the Taj Mahal, and the Hong Kong and Shanghai Bank. Roof top views of the orange streets of Renaissance Florence, the regimented grid of Chicago and New York or the chaotic growth of Mexico City all serve to portray the world to those unable to see it with their own eyes.

What this romantic view of photography neglects to portray, however, is that photographic images are only the vision of the person behind the lens. While the images selected above serve to describe the character of the city, photographs of new buildings are more often than not stripped of their context. Projects are portrayed in their cleaned-up, edited version, and those who are not able to visit the site are often left none the wiser as to the success of the built design.

The change of format for the presentation of photography in *World Architecture* is an acknowledgement that the tide is turning. The art of photography deserves to be celebrated, but its use and purpose must now be measured against the growth in the popularity and availability of computer aided design. For many firms, particularly the larger corporations, the presentation of their models and built projects is not complete without the accompanying hi-tech computer generated images of walk-throughs, details, elevations and sections. Beautiful photographs will help sell the building to the architectural press, indeed they are a must, but to be taken seriously many architects believe that the services of skilled CAD designers must be employed. In future issues of *World Architecture* we will be taking an active part in this debate, talking to architects and CAD specialists from around the world, and discovering what constitutes the perfect marketing and presentation package. While we may sniff at the practical inadequacies of photography there is an equally strong argument that could be levelled against antiseptic and even less personal computer images. What can be concluded before the start of any debate is that it is unlikely that one will be able to exist without the other, and that there is no substitute for visiting the building. *Nicola Turner*

In next month's World Architecture

BUSINESS

International news, reviews and previews.
OnScreen keeps abreast of the latest developments of computer-related innovations.

COUNTRY REPORT - Australia

Sydney Harbour, Australia

Over the last few years the economy of the Pacific Rim countries has grown despite the international recession. The economic forecast is not so promising short term, but a strong growth is forecast by the end of the century when critics believe Australia will be a serious rival to the Asian tigers. City rivalry stimulated by the country's Federalist character has resulted in a rash of public projects – from conference and congress centres to airports, theatres and museums. The Sydney 2000 Olympics has fostered high expectations, but projects have been slow off the mark; a case of "too little, too late". *World Architecture* probes beneath the glamorous sunny surface of Australia's lush residential suburbs and impressive tourist attractions to reveal the state of the country's relatively insular construction industry.
The projects cover Denton Corker Marshall's stunning Sydney Museum, Philip Cox's Brisbane Conference Centre and Allen Jack + Cottier

World Architecture's future Country reports will feature: October/South Africa; November/Malaysia; Dec/Jan will feature the World Survey of the Top 250 Architects.

PROFILE - Bremmer Lorenz

Studio Ivan Nemec

Gymnasium, Usingen by Bremmer Lorenz Frielinghaus & Partners

World Architecture profiles the work of German firm Bremmer Lorenz Frielinghaus & Partners, "a large firm that seems small". Founded in 1934 and having displayed the requisite versatility to survive through 60 years of social and cultural upheaval, BLF & Partners have always thought big yet managed to remain true to their small-town roots, as illustrated by their impressive new headquarters building, in the firm's home town of Friedburg, near Frankfurt.

Future Profile reports will look at Ramirez Vazquez in October and Architekturburo WGK in December/January.

SPECIAL REPORT - Education

Christophe Demonfaucon

Lyceé de Limours, France by Alain Sarfati

World Architecture focuses on projects which demonstrate a range of answers to education design from: one of James Stirling's last projects with partner Michael Wilford, the Temasek Polytechnic in Singapore; Zvi Hecker's "sunflower" Jewish school in Germany; Rudi Ricciotti's Cote Bleue college in France; RMJM's Harrow Campus for Westminster University and BDP's St Peter's Campus at Sunderland University, both in the UK, and finally, Roth and Moore Architects award-winning additions and renovations to two existing elementary schools on virtually identical sites in Connecticut, USA. All this, plus an overview of the major architects and projects by global regions.

Further special reports will cover hotel and leisure/October; residential building/November, and office design/December and January.

PRODUCTS - Seating

Carl Gardner interviews the famous architect and furniture designer, Vico Magistretti. New chair designs from Milan's Salon de Mobile.

In subsequent issues, Products will focus on computers/October; bathrooms and sanitary fittings/November and the office environment/ December and January.

News Review

WA's News and Business round-up

Calatrava's city coup

The Spanish engineer/architect, Santiago Calatrava has been commissioned by Wates City of London Properties plc to redesign the recently purchased Britannic Tower the second highest building in the City of London, UK.

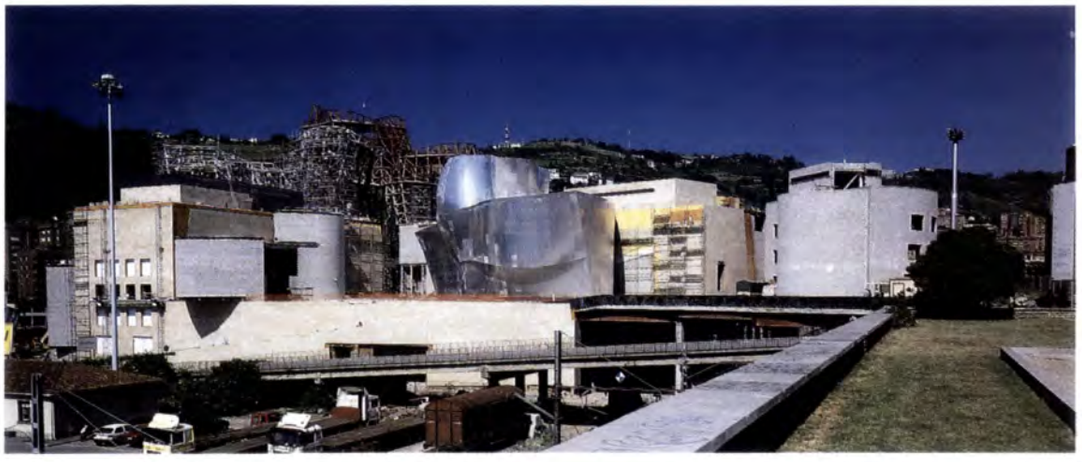
Rodney Clutton, Joint Managing Director of Wates City said that through the appointment of an architect of Calatrava's ability and standing, Wates hope to make the Britannic Tower "a true world landmark".

The existing building, comprising 430,00 square feet of offices and ancillary areas, will be vacated in December 1996. Wates aim to provide 30 floors of first class office space together with newly built adjoining office accommodation and a shopping, restaurant and leisure complex.

Calatrava's office are holding their plans until planning permission comes through, but it is safe to assume that the man whose sculptural designs include the TGV Station in Lyon, France, will produce something similarly eye-catching for the City.

BDP poised in Bilbao

The UK's Building Design Partnership are the latest to join a multitude of international architects and designers on the expansion and improvement of Bilbao, Spain. Not to be outdone by the giants already working in Bilbao – Norman Foster, Frank Gehry, Cesar Pelli and Santiago Calatrava – BDP have designed a new landmark building for shopping and leisure, called Ria 21, with Spanish developer Max Center (part of a group of companies involving the subsidiary of Dutch developer ING). The scheme has been shortlisted by the competition organiser, Bilbao Ria 2000, alongside one other, by German developer ECE. It is part of a masterplan for the Abandoibarra area of the city. BDP believes Ria 21 "helps to reinforce the river as a discovered place for culture and recreation".



Carlos Dominguez

Gehry's Guggenheim

Half way through, construction work for the Guggenheim Museum at Bilbao, Spain is going smoothly and the familiar Frank Gehry architectural forms are taking shape. Due for completion in 1997, the new museum, with an area covering 24, 000 square metres (auditorium, bookshop, restaurant, etc) and over 11,000 square metres for exhibition rooms, will allow Bilbao to join in the major international artistic events.

Polemic

Martin Pawley calls to question the popular perception of the late-twentieth-century task of urban renewal and suggests that inner city decay is an inevitable part of urban growth.

Face to Face

Studio MG are a young vibrant architectural practice hitting the scene in London. *World Architecture* finds out how they set up their business...and survived.

OnScreen

World Architecture surveys Netscape Navigator from the new Reggiani Lighting CD Rom; MIT's MediaLab update; and Bentley Systems MicroStation GeoGraphics.

Project Review

Horst Architects' Wood Residence at Laguna Beach, California reflects the state's rich design heritage and focuses on the curved planes of the surrounding landscape.

Siamese twin towers

By Layla Dawson,
Germany correspondent

About seven years ago Helaba (Landesbank Hessen-Thüringen) asked the Hamburg based architect Peter Schweger to develop an energy saving European skyscraper design, with wind tower techniques and a double skin facade, in which every work place had a window and every user the ability to control their environment. This project has now metamorphosised into Siamese twin towers, a circle and a square both 54 storeys high, for Frankfurt am Main in which the bank will rent 29 floors. Owners HELICON, a company set up by several banks in Hessen and Thüringen, has contracted OFB, jointly owned by the bank and American developer Hines, as project managers. Site work on the city's fourth highest building started in July for completion in 1999. At street level 3,344 square metres will be given over to a flaneur's passageway of shops and a grand hotel-style foyer, in keeping with planning policy to open up the streetscape. Above the banking floors every level will have four office units, of varying sizes, for rent. A restaurant for both tenants and the public, including private working lunch spaces, will be situated on the 38th level and another public restaurant with viewing platform at the crown of the tower. Some of the 261 underground parking places will also be for public use. Attractive for tenants will be the low heating and power energy use, only 17 kilowatt hours per cubic metre, achieved by using the 120, 50 metre deep, structural piles to transmit heat in winter and cooler air in summer out of the ground. Materials will be tested to avoid health risks and environmental pollution in an office space mock-up, and after completion the building's environmental qualities will be further monitored. Another example of "green" architecture being used by developers for market advantage.

German employment scam

In Germany fear of "wage dumping" under which workers are recruited in lower-wage EU states by companies which then "post" them to Germany, is growing. On arrival the employees work at half the prevailing wage levels. There are an estimated 200,000 "posted" workers on building sites. Their presence is resented by the similar number of unemployed German building workers.

The dispute over the minimum wage coincides with the worst downturn the construction industry has faced since 1945, brought on by the end of the post-unification construction boom and a general economic downturn.

Construction employers and the IG Bau building workers' union reached a provisional minimum wage accord in May, giving west German construction workers a minimum wage of DM18.60 (£8) an hour, and east German workers DM17.10. This compares with a going rate of about DM12 earned by a typical foreign EU worker on a German building site.

Peace heralds recycled barrack-housing

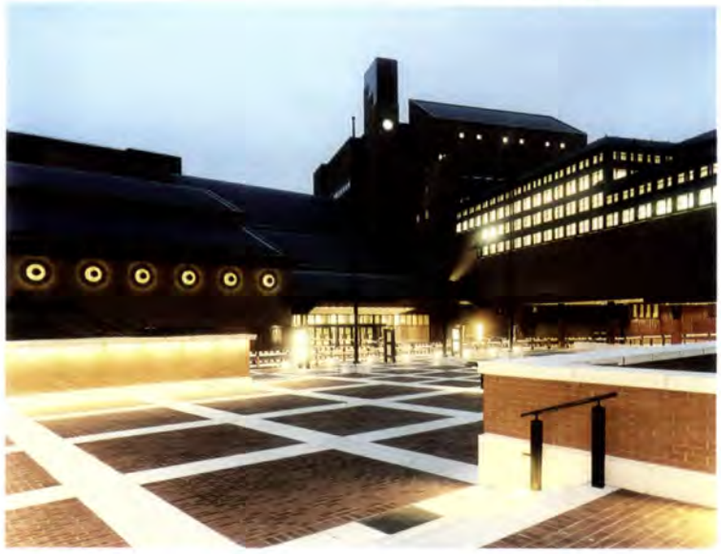
by Layla Dawson,
Germany Correspondent

The peace dividend resulting from the end of the cold war and more recent bank interest rate cuts have given Germany the opportunity to relieve its nationwide housing problem. Klaus Töpfler, Germany's building minister, during a visit to the former Wörmlitz barracks in East Germany's Halle, called for Lander and Kommunes throughout the country to make greater efforts in the recycling of abandoned American, British, French and Russian military sites for affordable family housing. In a "Köstensenkungs- und Wohnbaulandinitiative", (reduced costs and building land initiative), the Federal government has embarked on six pilot projects which it hopes will set an example. In Wörmlitz the first stage of new building and conversion will provide 100 family houses and flats for between 1,500 and 2,000 DM/square metre, inclusive of site costs, by 1998. Between 1990 and 1995, 15,141 sites, in total 342,638 hectares, reverted to German ownership. 6,808 of these sites have been sold, at a profit to the state of 8.5 billion DM, for residential developments. Another advantage of this land bonus has been that fewer green sites have had to be used outside the metropolitan areas. The other five pilot projects, apart from Wörmlitz, are in Augsburg, Cologne, Potsdam and two in Hannover. Project managers are the Forschungs- und informationsgesellschaft für Fach- und Rechtsfragen der Raum- und Umweltplanung mbH (FIRU).

RHWL to build London landmark

Lintas House, designed by RHWL will provide 17,932 square metres of high quality, flexible office space for client TSB Bank PLC and incorporate a ground floor restaurant and wine bar. The central form of the building is a clear glass ellipse with a curved aluminium roof enclosing the double height offices. In contrast the elements which address New Fetter Lane and New Street Square are more contextual and are clad in layers of red sandstone with bronze castings and metalwork.

British Library fiasco – costs rise to over £450 million



The British government report on the severe delays and cost overun on the 108,000 square metre British Library was produced by the government auditors in May this year. In November 1994 the Treasury agreed to increase the project's cash limit from £450 million to £496 million, but a source at the Department of National Heritage stated that more claims could arise before the final account is settled.

The report describes how contracts held by construction manager Laing, architect Colin St John Wilson and Quantity Surveyor Davis Langdon and Everest and others were drafted by the government's design division PSA Projects in the early 1980s and inherited by the Department of National Heritage in 1992. Cost increases were attributed to "the delays caused by the technical problems rather than the direct cost of putting them right". The report identifies "inadequate" quality control as the reason why defects in bookshelving and electrical cabling in phase one were not detected until 1992 when the work was too difficult to remedy.

Latin America's construction boom

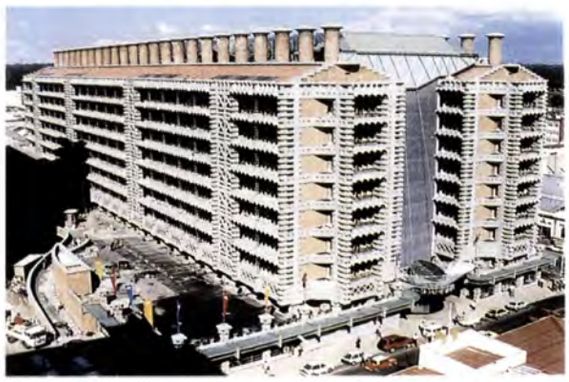
US$72 billion was invested in construction by Latin America in 1993 and with direct foreign investment currently exceeding US$17 billion, construction in Latin America is booming and there is a huge demand for imported materials.

Recent reports from the Department of the Environment in the UK suggest that the UK building industry – and inevitably the rest of Europe – should be looking towards Latin America as their next major export market. It has commissioned building materials market reports on Argentina, Brazil, Chile, Colombia and Peru to complement the Construction Sector Survey published last year.

Latin America has a fast-growing economy; record construction growth; new infrastructure spending levels of more than US$40 billion per year and growing political and economic stability throughout the region.

(For more information contact Michelle Cameron, DOE, London. Tel: +44 171 276 6736.)

Zimbabwe office "Trees for Life" project



The Eastgate shopping and office complex in Zimbabwe, designed by the Pearce Partnership, with Ove Arup & Partners as consulting engineers, displays the most advanced application of low energy passive design features in southern Africa. The central principle is to ensure that the optimum amount of night air is passed through the building to cool the concrete. The engineers Arup Harare were one of the leading sponsors of the "Trees for Life Project" which aims to save a percentage of the country's 75 000 hectares of woodland lost annually.

In Brief

Athens airport finance cleared

The project to build what will become Greece's main airport 25 kilometres from Athens attracted contoversy last year when the contract went to a German consortium, despite fierce lobbying by France. The airport will initially serve about 15 million passengers a year when it opens at the end of the year 2000. It is being developed as a joint venture between the Greek state and a consortium comprising Hochtief, ABB Calor, Emag Schaltanlagen and H Krantz.

The airport funding package includes grants from the Greek government, preferential tax treatment, state loans and guarantees. It will receive ECU 250 million support from the EU's cohesion fund and an ECU one billion loan from the European Investment Bank.

Indiana

Ellerbe Becket Inc has been selected architect by the University of Notre Dame in Indiana for a science teaching building located on the university campus. The estimated cost for the projects is US$50 million, programming is in progress and schematics are scheduled to start in September-October 1996.

£22 million estates buy

In a joint venture bid with Chelsea Link (a private company controlled by the Fu family of Hong Kong), Raglan Properties, has acquired six UK industrial estates for £21.8 million. The estates generate a rental income of about £2.6 million, but roughly 20 percent of the space is currently vacant.

Although this news coincides with a sharp decline in pre-tax profits from £5.65 million to £2.37 million for the year (following a £2.7 million provision to cover damages claimed against a fire in 1991 in a Raglan development in South London), Director of Raglan, Keith Holman said that Raglan hopes to make more acquisitions of this nature in partnership with the Fu family in the future.

Potomac Bridge design narrowed to two finalists

Officials from Washington, DC are searching for a replacement for the ageing and overworked Woodrow Wilson Bridge. They have narrowed the options to two: a US$1.5-billion, 12-lane bridge and a US $2.1-billion, 6,630-foot long, six lane bridge and a parallel 6,500 foot long, six lane tunnel. Their decision is due to be announced shortly.

Planners change Bangkok's land-use rules

The focus of this move is the Baiyoke Tower II, an 89-storey hotel which, under current zoning, is located in a section of narrow streets filled with small shops. Tony Edwards head of a European Union-funded team of overseas planners says that the hotel "only needed to comply with a regulation on structural integrity" while they are seeking "controls on intensity of development". The group includes the Cambridge, Mass.-based MIT Consulting Team and the Hong Kong office of Shankland Cox Ltd. It advises the Bangkok Metropolitan Authority. The team is seeking government approval next year.

World top 100 endangered monuments

"Those nihilistic romantics who have always insisted it would be more fitting if Venice did indeed sink back into the sea, never to be seen again and those more perturbed by the worldwide fetish for preservation at all costs than by the occasional missing temple, will never recover" said Adrian Dannat of *The Independent* newspaper. "Architectural history, like everything else, has now become as marketable and merchandisable as any other Top 40 chart."

Harvey Golub, Chairman and Chief Executive of the American Express Company said that "we view the preservation of imperiled historic sites and monuments as a vital cause, not only to our own future, but to the future of the whole travel and tourism industry." American Express, the founding sponsor of the World Monuments Watch, has committed US$5 million over five years to help rescue 20 sites in 16 countries. Following their example, over the last two months, the World Monuments Fund has received commitments of US$1.35 to help rescue 34 sites on the first annual World Monuments Watch List of 100 Endangered Sites issued earlier this year.

Sites that American Express have chosen to sponsor include Ayuttaya (the ancient capital of Thailand) and other flooded sites along the Chao Praya River. The Samuel H Kress Foundation has donated US$281,000 towards 12 sites in 12 countries including the hilltop village of Pocitelj in Bosnia-Herzegovina and the Starr Foundation has contributed US$50,000 towards preservation of the Preah Khan Temple in the Angkor Archaeological Districts in Siem Reap, Cambodia. The Ronal S Lauder Foundation has invested US$25,000 in preliminary planning for the conservation of Prózna Street in Warsaw, Poland.

Flood site, Thailand

People and Practice

Obituary

Serge Chermayeff, one of the last great survivors of 1930s English Modernism has died aged 95. His famous partnership with Enric Mendelsohn led to projects such as the De la Warr pavillion at Bexhill, UK (*above*). Alan Powers, of the Twentieth Century Society, claims that Chermayeff's contribution has been underestimated. After their amicable separation he went on to design some outstanding buildings on his own, his favourite of which, the ICI Laboratores at Blackley was demolished. Chermayeff leaves behind a UK legacy of influential buildings of which the Bexhill Pavilion and his house at Bentleywood are the most famous.

Britons link up with Central Europe

British consulting engineers, safety experts, lawyers and finance specialists were among the British firms visiting Bucharest in Romania, and Sofia in Bulgaria, this spring. The mission was organised by the British Consultants Bureau (BCB), with the aim to promote their skills and form business links within the region.

SH&G and Ove Arup steer into successful alliance

Smith, Hinchman & Grylls, based in Michigan, US and Ove Arup, based in London, UK, have merged their expertise in international automotive industrial design to form SH&G/ARUP. SH&G will lead and design the projects originating in Detroit, and Arup will provide the country-specific design engineering and local site experience. Ove Arup's previous clients include Toyota Manufacturing, BMW (GB) Ltd, Cummins Engine Co Ltd and Magneti Marelli. SH&G have worked for the Chrysler Corporation, Ford Motor Co and General Motors, among others.

Arups expands into Vietnam and Lithuania

Ove Arup have set up a new project office in Vilneus, expanding their already substantial base of 60 countries in which they operate. Their task is to prepare an implementation plan for improving infrastructure in the area including the north-south and east-west corridors. The company have also won a two year project in Vietnam to develop the Vietnamese Standards for building construction, and the provision of specialist training for local engineers.

Rumours surround appointment of a Mayor of London

If the Labour Party comes to power after the next British General Election, as seems increasingly likely, they have pledged to appoint a Mayor of London (not to be confused with the nominal position of the Lord Mayor of the City of London) to oversee a London Council. Currently, London is the only major city in Europe not to have a specifically designated city-wide agency. Nimes, in France, and Barcelona in Spain, have both benefitted hugely from the employment of an active and charismatic leader. Richard Rogers has long been suggested as a likely candidate. Now, as Michael Cassidy, the chairman of the policy and resources committee of the Corporation of London, retires, the national press are speculating on the possiblity of harnessing his knowledge and expertise to the as-yet-hypothetical post.

Lighting up the Asia Pacific

The London based international lighting design consultancy, the Lighting Design Partnership, has opened a Sydney office to service the increasing volume of work in Australia and the Pacific Rim. This move has come about on the strength of the firm's successful work on Brisbane International Airport, featured in this month's *Special Report*. The head of the Sydney office will be Tim Downey.

AIA announce delegate for Architects' Council of Europe

Thomas Vonier has been appointed by the American Institute of Architects as first liaison delegate to the Brussels-based Architects' Council of Europe. This is the first time that a formal relationship has existed between the AIA and ACE, and is significant for issues relating to the General Agreement on Trade in Services and other matters due to come before the World Trade Organisation in Geneva.

New head for Gensler Hong Kong office

Peter Gordon, a Vice President of Gensler, has been appointed Managing Director of the firm's Hong Kong office. Gensler have dramatically increased their work within the Asia Pacific markets in the last few years.

Chicago structural engineers announce their partnership

Robert A Halvorson and Tim Scott Kaye have merged to form a new firm, Halvorson & Kaye/Structural Engineers. They will offer independent structural engineering services to both public and private clients worldwide. Both men hail from Skidmore Owings and Merrill.

US$14 million inflatable satellite

At 50 feet in diameter with 92-foot structs the antenna of this satellite is the largest inflatable space structure since the 1960s. The National Aeronautics and Space Administration hopes that the experiment will demonstrate the feasibility of launching spacecraft with inflatable antennas, sun shades and other major parts. A spokesman from the space centre in Houston claimed that "inflatable structures are much lighter and cheaper than traditional mechanical systems and should be more reliable because they have fewer moving parts". The gigantic orbiting nitrogen gas filled ballon, was launched from the space shuttle Endeavour and set free 180 miles over Australia.

Asset spin-offs in Hong Kong

As the Hong Kong real estate market continues to rise Cheung Kong (Holdings) Ltd joins in a move to spin off its infrastrcuture businesses in a public offering. Other property companies to have considered this are New World Development Co, Henderson Land Development Co, Wai Kee Holdings Ltd and Hopewell Holdings Ltd. Cheung Kong has also applied to the Stock Exchange of Hong Kong to sell shares in the subsiduary. This trend follows the principle that businesses are often worth more on their own than grouped into one company because investors get a clearer picture of what they are buying and executives can sharpen their focus on particular areas.

RTKL in Malaysia, Canada and Saudi Arabia

RTKL's design for Tenega National Properties Sendirian Berhad (TNB)'s headquarters in Kuala Lumpur, Malaysia, (*right*) was selected following an international competition among seven renowned architects including Sir Norman Foster, Helmet Jahn and Jean Nouvel. Los Angeles based RTKL's design will be executed by Kuala Lumpur based GDP Architects sdn bhd.

The tower is comprised of two major elements: a 65-storey glass and stainless steel tower with eye-shaped floor plates and a connected 80 storey star-shaped service tower clad with a metal screen. RTKL's architects have aimed to create a dynamic tension between the two vertical structures – dark juxtaposed with light, solid against fluid and metal against glass.

Vice president of RTKL, Sudhakar Thakurdesai claims that "The design is inspired by the transmission of light, power and electricity as well as the country's rich cultural heritage and strong Islamic character." In response to the "electrical" character: the slender profile of the connected service tower recalls a lighting rod, collecting and transmitting pure energy for the city. Its placement next to the main tower increases the flexiblity of the typical

office floors and allows natural light and ventilation.

The "islamic" element can be seen in the entrance lobby which is positioned at the end of the plaza and relates formally to an existing headquarters building. Conceived as the building's generator, the lobby has an inner layer of glass sheathed by an exterior metal skin with Islamic patterns.

In Canada...

RTKL has been awarded the design contract by Cambridge Lease/Hold Ltd and Ontario Teachers Pension Fund to expand the Chinook shopping centre (*below*), located on the McLeod Trail in Calgary, by 3000 square feet. Petroff Partnerships Architects of Toronto is the architect of record and PCL Construction Management Inc of Calgary is the contractor. Construction is scheduled to start in January 1997.

In Saudi Arabia...

RTKL's Dallas office are to provide architectural and design services for the US$180 million expansion and renovation of Al Salama Hospital in Jeddah. Their task is to redefine the 250,000 square foot hospital and redesign the interior layouts of two major extensions.

Errata

WA 45 – Apologies to RAN International Architects + Engineers, of the SkyDome, Toronto. In the *Special Report* on sports stadiums the total cost of the project was quoted as US$500 million. The correct figure is US$315,770,530.
WA 46 – In "British architects get to grips with door furniture" the concept design team for Foster's Fusital Range should not have included Sabiha Foster. Our apologies to Foster and Partners for the misunderstanding.

Power plant plans

Three new investors have come forward in a last ditch attempt to save the doomed Battersea Power Station on the banks of London's River Thames. For years the dilemma of what to do with this incredible hulk, designed by Sir Giles Gilbert Scott, has dogged city planners and government officials.

The station is owned by Parkview, a major Hong Kong property developer, and a £200 million deal is being put together by the composer Andrew Lloyd Webber's Really Useful Group, BAA (formerly the British Airports Authority), and McArthur/Glen, a Californian retail group. Architects Arup Associates have been employed as master planners. Rumour has it that the building's shell may be used to house a mega media city or indoor sports facilities. Whatever is decided, it had better be soon.

WA's 1997 World Survey

We are currently compiling the 1997 *World Architecture* survey of the world's top 250 architectural practices. If you would like to participate please contact Robert Taynton: Tel: +44 (0)171 470 7000; fax: +44 (0) 171 470 7007; *World Architecture*, 3-6 Kenrick Place, London W1H 3 FF, UK.

News Analysis

Chicago chooses Kleihues for "severe aesthetics"

by David Cohn, US correspondent

The Museum of Contemporary Art in Chicago, the first North American work by the Berlin architect Josef Paul Kleihues, was inaugurated in a 24 hour summer solstice celebration on 21 June this year. Kleihues was chosen as architect in 1991 after an exhaustive search involving 200 firms. According to Museum Director Kevin Consey, he was selected not only for his experience with museums and contemporary art, but also because the building committee sensed an affinity between the "harsh, northern environment" of Chicago and Berlin, and appreciated "the severe aesthetic of Germany, which seems to have an interesting resonance with the vocabulary of contemporary art."

Kleihues has designed the museum as an exercise in his personal architectural theory and method, "poetic rationalism" with its flights of the neo-classical sublime brought to earth by a three-dimensional grid of 26 foot square modules. Kleihues responded to the canyon-like site, set between tall buildings in the centre of a narrow park that runs from Michigan Avenue to Lake Michigan, with a tripartite pavilion of two solid volumes framing a glazed central void and raised on a limestone plinth. The centralised entry via a grand stair was lifted rather schematically from Karl Friedrick

Steve Hall, Hedrich Blessing

Steve Hall, Hedrich Blessing

Schinkel's Altes Museum in Berlin, a paradigmatic reference for Kleihues, and affords sightlines through the building from Michigan Avenue to the lake.

Square in plan, the building is backed by a sculpture garden of equal dimensions which steps down to the street in loosely-planned terraces. The ground level, with education centre, auditorium, bookshop and services, supports a main floor where two 80 by 80 foot temporary exhibition spaces face each other across an axial promenade that traverses the building from the entry lobby to a glazed belvedere with a cafeteria and restaurant overlooking the garden, in a plan generous in rhetorical Schinkelian circulation, although exhibit spaces are appropriately neutral. The skylit upper floor contains ranks of barrel-vaulted galleries for the permanent collection.

The building is clad in cast aluminium panels, a material chosen because it acquires a patina with age. They are covered with a texture of 3/8 inch pyramids, giving the material a certain ambiguity when seen from a distance, and are fastened with exposed stainless steel pins; Kleihues feels that the ordered craftsmanship of assembly should be celebrated. The gridded structural frame is not exposed, but rather traced across the facades by two foot-wide panels, which function like neo-classical pilasters, in an assertion of concept over functional expression.

In Kleihues' superposition of "poetics" and "rationalism", the potential for poetry certainly holds appeal: his search for "serenity" and "reserve"; his interest in the Corbusian play of light over basic geometric elements (although we miss non-quadrilateral forms in his work, except as decorative motifs inscribed in squares); his feeling for geometry as "a symbol of eternity, or shall we say universality," and at the same time his aim to give his works an individual identity, forged out of programme and the site.

In the name of "reason", however, there is a certain narrowness and over-restriction in Kleihues' expressive range. He makes too much of the unclassical plan changes from one floor to another, for example, including the suppression of columns on occasion, proudly associating this break from the discipline of the grid with the Chicago School, as in Sultan's "pragmatically" free floor plans for Carson Pirie Scott. And when I asked if he had ever experimented with the Golden Mean as a proportional system, he replied that "you can achieve nice harmonies, but when you really control it, you come to a point where it doesn't work consistently at all." Kleihues also distances himself from a "Nietzchian" expressionism and "irrationality", warning of the excesses of romanticism and mysticism which haunt German history, although others may find his austere ordered self-repression similarly haunted, suggesting a curious dilemma of national cultural identity.

Libeskind's extension to London's V&A causes predictable consternation

The film director, Peter Greenaway claims that the new "boilerhouse" extension to London's Victoria and Albert Museum, designed by Daniel Libeskind "might redress the fiasco of the National Gallery extension". Greenaway was referring to the Venturi, Scott-Brown American husband and wife partnership who designed an extension to the National Gallery intended to be in keeping with the rest of Trafalgar Square. If the Libeskind project is anything like his Jewish museum in Berlin, say the modernists, then this deconstructed, tile clad extension will become a site in itself, in the spirit of the Eiffel Tower or the Pyramid at the Louvre. This was echoed by Jonathan Glancey, architectural critic of the UK's *Independent* newspaper, who suggested that the new gallery is "one of the most remarkable, exciting and controversial buildings proposed in this country this century". But, say the traditionalists, it is a self-conscious architectural statement rather than a functional gallery space and bears no relation to its architectural context. In *The Times*, former editor William Rees-Mogg described it as "a disaster for the V&A in particular and for civilisation in general". Architect Richard Weston argued that Libeskind's architecture "is designed to discomfort physically, perceptually and intellectually". Colin Amery architectural critic of the *Financial Times*

argued that "Deconstructionism is a set of old ideas that elsewhere were passé years ago".

From outside the field of architecture, Greenaway told *World Architecture* "Architecture brings out the worst in people. There is a desperate conservatism, a real lack of ideas in the way that people shock and horror at something new. What is so pathetic is that within ten years or so, everybody loves what they originally hated. How fickle we all are!"

Paris fire poses restoration problems

by Michael Rowe, France correspondent
The fire that roared through the Paris head office of the Crédit Lyonnais in the Boulevard des Italiens in May has left the government-owned bank with several major decisions.

One issue is whether repair works – which are likely to cost more than FF1 billion – should restore the historic 38,000 square metre building to its former state. This question is currently being discussed with the bank's insurers, the AGF. Around two thirds of the interior were engulfed by the blaze, though much of the facade remains intact. The building housed some 2,500 staff.

Another item on the agenda is whether the Crédit Lyonnais should take this opportunity to move its head office departments out of the city centre altogether into more modern accommodation. It already owns a tower block in the La Défense business district to the west of Paris, and several new building schemes are scheduled to provide further office space there in the near future. These include the projected Hines and Phillip Morris towers.

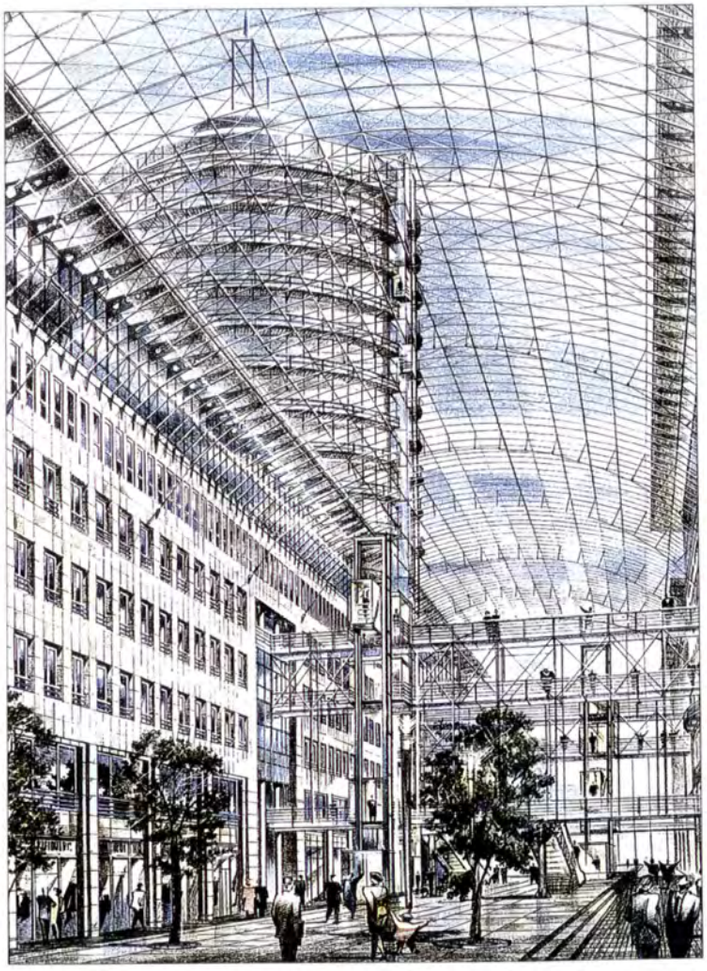
Classified in part as an historic monument in 1989, the Crédit Lyonnais office was built by stages between 1878 and 1913 in the grand style associated with Baron Haussmann. The architects Bouwen, Laloux and Narjoux worked in succession on the construction, and the name of Gustave Eiffel has been linked with some of the ironwork.

The main motives for moving would be to cut costs and maximise profits. Over recent years the Crédit Lyonnais has lost heavily on sectors such as real estate lending and corporate financing. Under CEO Jean Peyrelevade the bank is now painfully slimming down and restructuring in readiness for privatisation.

Any such move would raise wider urban planning considerations. The Paris city council is keen on shifting part of the capital's business activities away from the overcrowded western districts, and it also wants to stem the seepage of business locations from Paris city to the western suburbs. The much-delayed Seine Rive Gauche redevelopment project in the south east of the city, which includes plans to build 900,000 square metres of office, provides a key element in these plans.

Michael Rowe

Trading on an image



by Layla Dawson, Germany correspondent
Building in East Germay since reunification has had more to do with futures building than guaranteed short term returns. The recently completed World Trade Centre on the west side of Dresden's city centre, on the site of a former chocolate factory, includes 90,000 square metres for offices and shops, a 580 seat theatre for the "Komödie Dresden" and a three star hotel with 242 rooms. The Hamburg architects Nietz Prasch Sigl und Partner have designed for the Hamburg developers, Büll & Liedtke, a nine storey office complex with five wings at right angles to a 27 metre high glass covered pedestrian mall, with a 17 storey circular glass tower as a city landmark.

Architecturally the project has tried to set new design standards, with an elegant curved glass wall, symmetrically punctured stone clad blocks and filigree steel details. The Stuttgarter, Jörg Schlaich, reputed to be Germany's most innovative structural engineer, has created the mall's glass roof vault and its two end curtains of sheer hung glazing. Within the mall tree and planting boxes are all on wheels so they can be repositioned to make way for a temporary stage and auditorium to seat a thousand. This is Dresden's largest inner city property with the capacity to employ 3,500 in office jobs alone, but however attractive the architecture, there has to be economic interest. To breathe life into the development the shops must be occupied, performances financed and the glass mall must be seen as the preferred route between other lively parts of the city.

Face to face

Hunting in a pair

Architects in the UK are considered "young" well into their fourth decade. For truly young designers British architecture is a tough world to break into and get recognised. But with formidable determination and charisma Craig Moffat and John Grimes, award-winning first-class students from the Mackintosh School of Architecture in Glasgow, Scotland, are well on their way to becoming the most talked-about "new comers" on the scene. Studio MG was officially launched in May this year, after the pair had worked individually in France, Holland and the UK – including Moffat's stint with Zaha Hadid. In conversation with Nicola Turner the dynamic duo describe the pleasures and pitfalls of setting up a new business. Photograph by Carlos Dominguez.

In 1992 Craig Moffat and John Grimes won an open competition for a sports centre in France, at the ages of 25 and 24 respectively, teaming up with a French practice Kerosene Architects and forging a rich combination of youth and experience. Since then the pair have broken out on their own after stints with various other firms. Their competition entry for a footbridge in Bedford (shown here) in 1995 received joint fourth position, overshadowed only by Santiago Calatrava (who came joint second) and the winner, Chris Wilkinson.

As a result of working in France Moffat decided not to return to the fantastic world of Zaha Hadid – in whose office he had worked while still a student. "I decided not to go back to Zaha, even though I had so enjoyed it, because I didn't want people to see my designs and say 'oh yes, that's that Zaha person'. The breadth of experience I gained there was bound to be limited, and I thought it was about time that I got to build something." His fear was well founded. Climbing the stairs to the top floor studio the deconstructivist forms on the walls are a constant reminder of Moffat's pedigree, but entering the recent exhibition of Studio MG's work visitors are assured that things are moving on.

As a result of this decision Moffat chose to look for a practice with "no great design flair", so that he could go in and be running two or three jobs within six months. "I was quite mercenary about it when we got back to the UK, and started to build up relationships with large developers and contractors. I don't see that there is a clear definition between commercial architecture and non-commercial architecture. The way funding is arrived at these days you are always inviting commercial architecture, the route the building takes from the bank to the architecture practice is all commercial. Unfortunately, we just don't seem to have the right attitude towards commercial building in the UK just now. Look at the British Library; 25 years, and £60 million and the French put up four glass boxes in 12 months...Perrault was only 28 when he won that competition, and 34 when it was completed."

The pair can't say enough about their admiration for the French construction process. Even if the majority of it is politically manipulated at least there is always the opportunity to witness new building. As Grimes explained: "The best inspiration we had in Paris was seeing new buildings being put up...we were surrounded in the African quarter by stunning modern crèches, for example, being inserted into ancient buildings."

The juxtaposition of styles is accepted and even expected in France, but Studio MG agree that saying to a client in the UK that what they want might take four years to get through planning is hardly helpful advice. At this point Moffat cites an example of his work in Paris when his boss took one look at the designs for a new school extension and berated him for uncharacteristically reserved work. "I was doing what I [used to] do here...In the end we ended up doing a marble-clad extension with steel edges, and the client loved it. In the UK we're going to have to work hard to achieve this by explaining the process to the clients."

"One of our strong points" says Grimes, "is that we sell ourselves as young and exciting designers. To start with clients must see that we can do clever, money saving things for them, with space planning etc. Then they build up the confidence to build a constructive relationship. Clients will then start

to search us out. People who are successful in business, and are commissioning new buildings, tend to have that extra creativity and imagination", he says somewhat sweepingly, "so why not look for a designer that feels the same".

On a shrewder note Grimes observes that the real advantage the practice has is the head start they have made on their contemporaries. "Hopefully as the recession improves there will be a clutch of opportunities for new design, just as others start thinking of setting up on their own...by the time we're 35 we'll have one hell of a portfolio, and from a business point of view we have the back up of a Business Link advisor [from whom Studio MG secured their start-up loan] for the next 18 months to keep us on the right track".

Despite the boundless optimism and fresh-faced outlook the practice have on future opportunities there is a reassuring realism about their approach to the daunting task ahead of them. Moffat is still courting the contractors and shortly before the interview he received a call from a contracting firm offering Studio MG a £300,000 project for a health club outside London.

"We're not so naive to think people are going to approach us just because of who we are tomorrow"

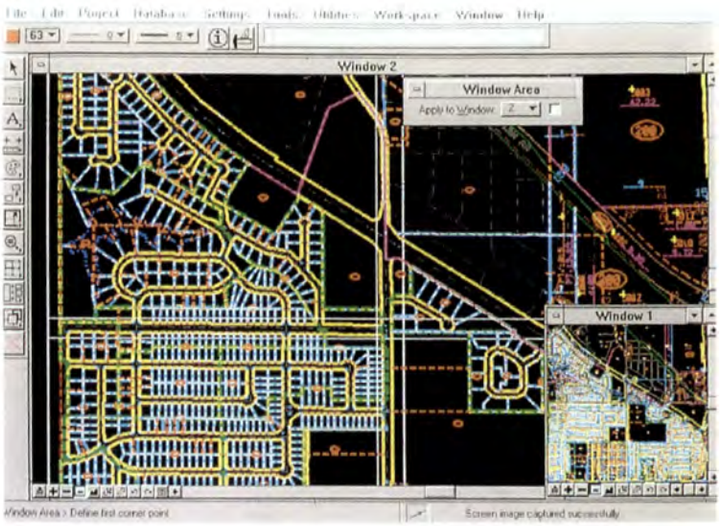
As for being in London, rather than their beloved Paris, both Moffat and Grimes admit that it was a purely business-based decision. Grimes decided that it was time to get the "hardnosed building experience in...and we felt London was our best opportunity. In Paris we were always going to be outsiders...I went off on a business course, through Business Link, and put a business plan together and took out a loan. They were classic. They taught me everything architects don't get in their training, how to go about marketing, how to put proposals together. Historically you sit in a practice until someone in your family offers you a commission, and we decided this wasn't going to happen in our case...We had help from a Business Link consultant the whole way through, and since then we have been used as their case study." They now have two strategies: one is to construct beautiful buildings, and the other is to ensure that they have the business structure to facilitate this.

"We also realise that there is an enormous market out there for people who don't know what architects do – think they're too expensive and arrogant, but if they did know would use them. We've got to aggressively market them. We're now in a position to go to seminars and presentations linking with chambers of commerce. We're not so naive as to think people are going to approach us just because of who we are tomorrow."

"Now it begins to sink in...we're bloody good at what we do. We want to consolidate over the next year or two, become fairly hard nosed business men, once we've got that off pat, set up a management structure and come down a bit heavier on clients, saying 'Let's do some more funky stuff'." WA

OnScreen

Below left *Reggiani lighting in the auditorium of the SS Costa Romantica built by Fincantieri.* ***Below*** *Screen shots from MicroStation Geo-Graphics* ***Bottom*** *Silas T.Dog, designed by Bruce Brumberg*



READY WITH REGGIANI

Proof of the increasing acceptance of Net software as general operating software comes from the new Reggiani Lighting CD-Rom, which uses Netscape as a viewer (a single machine intranet!) The package includes Netscape Navigator if you do not already have it, and the contents are available in 27 languages.

Reggiani is an Italian lighting company specialising in architectural interior and exterior fittings. Their design style has been recognised in a number of national and international awards. The new CD-Rom, launched at the 19th Congress of the International Union of Architects in Barcelona in July 1996, contains a showcase of recent installations, a catalogue of the product range with illustrations of the fittings, and technical specifications. A useful feature is a series of recommendations for different spaces, such as retail units, offices, hotels and public areas. Also included is their calculation program, which works under DOS, and allows you to calculate lighting levels on the working plane in any regular rectangular space. The program allows different configurations and mixes of fittings, and is a useful entry-level lighting program for interiors.

The Reggiani CD-Rom is a supplement to their Web site *(http://info.co.uk/reggiani)*. This development shows how aware manufacturers are, using new communication media to distribute information and product support, as well as advertising their wares. *Information from http://info.co.uk/ reggiani*

WALK THAT DOG

If the future is going to be virtual, and the design of interior space is going to be graphic rather than physical, how is it going to work, and what is it going to look like? One of the best places to find out is the Media Lab at MIT in the US. At the Siggraph exhibition in 1995 they demonstrated the Smart Room, and there are now updates of this event on their Web site.

The principle behind the Smart Room is that the user interacts with a virtual space without the need for a headset and dataglove. He or she sees a virtual video image of themself in a wall-sized television screen. A video camera tracks the user's movement and gestures, and a program interprets these. This system, called "pfinder", first performs routines to identify the figure of the user from the overall video image of the room, and then interprets elements in that figure (hands, feet, head and so on) to establish where the figure is moving and what it is doing. The video screen mimics these exactly, and the data supplied by them is shared with the other occupants. Pfinder has been developed by Professor Alex Pentland and his colleagues at the Lab.

Devising a system to identify and interpret a human figure from a video image is a major step forward in human/computer interfaces. It means that the system can be used and the data can be interpreted by an intelligent agent. Intelligent agent is the term developed by Nicholas Negroponte, head of the Media Lab at MIT, to designate computer programs that will not merely react to commands but also respond to situations and suggestions on the basis of past knowledge or, as in this case, gestural interpretation. (A program to search a database for an image of a building for example, could come up with anything from the White House to the Waterloo International Terminal. An intelligent agent would remember the user's tastes and analyse the unspoken context of the request, and come up with suggestions closer to the actual requirement.)

A splendid example of this is the virtual dog used as a demonstration model by the team at the Visual Modelling Group at the Lab to show how an intelligent (or autonomous) agent can react both to the world around it and to the human user. Pat the dog and it wags its tail. *More information from http://www. media.mit.edu/MediaLab/Noteworthy.html*

LEARNING GEOGRAPICALLY

Integrating information from GIS (Geographical Information Systems) into CAD packages has often been a headache: different file protocols can create transfer problems so that the site information from the survey cannot be read accurately into the CAD document. Often users such as planners, architects and engineers have had to keep the two sets of information on separate, dedicated systems, doubling capital costs and increasing work time.

At the MARI 96 show in Paris, Bentley Systems came up with their answer to this problem, called MicroStation GeoGraphics. It is both an end-user product, and a development platform, with over 45 software developers currently working on specific task packages, including aeronautical charting, land information, road design, terrain modelling and waterworks management. The program is deliberately open and broad-based to deal with a range of different land data systems used in Europe, and the needs of different users. The suggested European retail price is just under US$2,500. This product looks like helping to consolidate Bentley's good position with MicroStation in the current GIS market. *Contact Bentley Systems Europe on Tel +44 1344 412233* WA

Live in the city, get less out of life

"the popular perception of the late-twentieth century task of urban renewal could be based on a serious error"

Why is it that whenever one hears talk of city centres, it is because they are in need of being saved? The First World Congress of City Centre and Downtown Management, sponsored by the International Urban Development Association based in The Hague, was dominated by special pleading for would-be urban renewal projects. There were more than 320 delegates present, including city and business leaders from Israel, Belgium, Portugal, Egypt, Hungary, Senegal, Japan, Trinidad, Saudi Arabia, Canada and New Zealand, but all of them had one aim in view – to persuade their governments to devote extra funds to urgent city centre projects.

Interestingly the question of why city centres are in such bad shape if they are so important seems never to be asked, probably because the answer is supposed to be self evident. Cities, we are told, have been mismanaged and drained of resources by years of misguided government policies, not only in Europe and the United States, but in South America and Asia and former colonial countries everywhere. As a result they face acute problems directly traceable to the decline of their economic base which has led to a combination of too much office floorspace and too little public amenity. This syndrome can certainly be seen all over Europe. What was once the core of the city, and its liveliest part, is now in decline and facing desertion. But what can urban renewal programmes really do about it? What the urban boosters are asking for is, first, money to turn the clock back, and second, more money to subsidise an uncompetitive location. In defence of this inherently unconvincing project they cite the same old handful of places where it allegedly worked. In Chicago a single Monet exhibition is claimed to have brought US $250 million of business into the city centre. In New York the Walt Disney Corporation's entry into Times Square has turned an area that was once home to drug addicts and derelicts into an entertainment centre. In Michigan the city of Kalamazoo is supposedly standing on its own financial feet again as a result of a regeneration programme that involved turning an abandoned department store into a children's museum. At urban conferences there is always a fund of stories like this, and always something faintly suspect about them. They have the sound of improbable, atypical events.

It is probably hard for the International Urban Development Association to admit it, but there is another way to look at all this. A way that suggests the popular perception of the late-twentieth century task of urban renewal could be based on a serious error. In trying to encourage downtown development by political and financial means, our city centre enthusiasts may merely be fighting an uphill battle against a force so powerful that they hardly even recognise it.

Supposing the process of inner urban decay is itself part of the mechanism of city growth, without which no expansion will occur. In the natural world there are parallels to our cities, for example there are "cities" formed by reefs of oysters, barnacles and other molluscs, built up over centuries into enormous encrustations in shallow coastal waters, and then, through an internal process of decay, rendered unstable and irreparable so that the sea, their natural environment, eventually disintegrates them to begin new "cities" elsewhere.

This analogy suggests that what we perceive as urban expansion and decentralisation today might not necessarily be a growth process at all, but rather the final stage in a process of decay that began with the overloading of the infrastructure of the city itself, and the consequent loss of its own ability to repair and maintain itself. Urban diffusion outwards might then be the only kind of growth possible, growth that stems from the loss of elasticity in the central urban fabric and its growing inability to maintain itself.

If we accept for a moment this contention, that cities spread because they erode, then we can visualise the process of perimeter expansion of any city as a kind of moving and flattening gradient, extending from an original high point at the city centre, to an original zero point at its administrative boundary. It is the flattening of this gradient, which slowly evens out from its original urban high to its later perimeter high, that is the real story of urban growth.

As this description makes clear, such a process would have to have begun long before our century. Senescence and decay are not functions of modern planning policy, they are part of the environment into which planning was born. Urban decay may in fact be a process that is profound and irresistible in its effects. Something compared to which planning is trivial and powerless, and urban renewal a myth.

In order to be able to take this view we would have to see the present city centre crisis as part of the urban topography and demography of the last one thousand years. We would have to look at our cities, not as individual arenas for political careers, but as exploding megastructures that are ceaselessly breaking up into dispersed, low-density microstructures. In such a long-wave context the conventional idea of urban renewal would assume its correct proportions, and be recognised as no more than a short-lived denial of the unstoppable haemorrhaging of the substance of urban life out onto the smooth carpet of out-of-town autoroute settlement. And if this last process sounds rather close to home, then we might reflect that it is the enormous added force given to it by the motor vehicle and electronic communications technology that is driving the final phase of the collapse of high-density human habitation our city boosters are trying to prevent today.

Martin Pawley

Events

LECTURES, CONGRESSES AND CONFERENCES

ISRAEL
International conference on innovative urban and architectural policies. 9-16 July 1996. Seminar: "Technology, place & architecture". Contact Lynne R Rosman. PO Box 7912, 91078 Jerusalem, Israel.
Fax: +92 72 2 610028

ITALY
33rd IFLA
IFLA (International Federation of Landscape Architects) congress: "Paradise on earth, the gardens of the 21st century". 12-15 August 1996. Enic Go Round, via Faentina 40/r, I-50133 Firense, Italy. Fax: +55 58 3300

RUSSIA
The Fourth Russian Festival
"Architecture 96" 22-27 September 1996. The purpose of the Festival is to demonstrate the potential for architecture and construction within "New Russia" in terms of market economics. Union of Architects of Russia. 103001 Moscow K-1, Granatni per, 22, Russia. Tel: +95 291 55 78 (President of the Union of Architects);+95 203 6911 (Foreign Relations Department). Fax: +95 202 81 01

SPAIN
XIX Congress of the International Union of Architects.
Main exhibitions: "Present and Futures. Architecture in Cities" and "Contemporary Barcelona". 29 June-7 July 1996. Contact: UIA Barcelona, 96 Placa Nova, 5 E 08002 Barcelona, Spain. Tel: +34 3 412 76 51. Fax: +34 3 412 67 95

UK
London in the 21st Century
A series of public debates on new visions for the capital: 3 July, Communities or Ghost-towns? Housing in London; 12 July, The State of the Capital: Changing London for the Good. All debates: 6.30pm at Westminster Central Hall, London. Tickets available on the door.
Tel: +44 171 332 3770

Halon Alternatview '96
11-12 September 1996. Conference on "Loss Prevention – planning for the future with and without Halons into the 21st Century". Contact: May Husseyin, Training Administrator, Loss Prevention Council, Melrose, Melrose Avenue, Borehamwood, Hertfordshire WD6 2BJ, UK.
Tel: +44 181 207 2345.
Fax: +44 181 236 9701

USA
IDSA 1996 international conference – Worldesign 96: "Alternative Realities: 7 continents, 6 billion people, 4 oceans, 1 Worldesign". 18-21 September 1996. IDSA 1142 Walker Rd, Great Falls, VA 22066 USA.
Fax: +703 7597679

ARCHITECTURE AND DESIGN COMPETITIONS

BELGIUM
Interieur 96 "Design for Europe". International competition, open to all designers, groups of designers, students and educational institutions, calling for projects which constitute a creative contribution to interior design (private and public). Reception of prototypes 9-14 September 1996. Interieur 96, Groeningestraat 37, B-Kortrijk, Belgium. Fax: +32 56 216077

FINLAND
International Finnish Wood Innovation Competition
Two cataegories: A. Innovation for construction, living and environment; B. Innovative industrial wooden products. Deadline 31 July 1996. Finland Wood Innovation Project, Fabianinkatu 9A, FIN-00130 Helsinki, Finland.
Fax: +358 1 13245599

Primary School Design
935-pupil comprehensive basic school (a new type of school for four years of primary and five years of secondary education) including Montessori classes and special needs. Must include youth, cultural and community facilities. Contact: Espoon kaupunki, Tekninen keskus, Talonsuunnittelupalvelut, Virastopiha 2C, FIN-02770 Espoo, Finland. Applications by 17 September 1996.
Fax: +358 0806 5562

GERMANY
Solar Build – European students' competition.
Design of "solar buildings". Competition open to students enrolled at schools of architecture in: Austria, Belgium, Denmark, Germany, Finland, France, Greece, Great Britain, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden. Deadline 30 September 1996. Universität Stuttgart, Lehrstuhl 2 für Baukonstruktion und Entwerfen, Keplerstrasse 11, D-70174 Stuttgard, Germany.
Fax: +711 1213252

International Industry Forum design competition. Open to all manufacturers and designers whose products have been on the market for three years or less, and which fall into the categories: office, home, household, lighting, domestic technology, leisure, industry, transportation and medical, interface. Pre-selection deadline: 1 August 1996. Contact: Industry Forum Design Hannover, Messegelände-IC, D-30521 Hannover, Germany.
Fax: +49 511 893 2407

ITALY
Research Centre/ Museum Design Competition.
European students competition. Two subjects: Research institute and international university centre, S. Servolo island; Museum of contemporary art, Lazzaretto Vecchio island. Deadline 5 July 1996. Contact: EASA sezione di Venezia c/o IUAV, Senato Studenti, Tolentini, S. Croce 191, I-30135 Venezia, Italy. Fax: +41 2571788

USA
Greenport Waterfront Park
Open to architects, planners, landscape architects, engineers, student-faculty teams and students. Multi-disciplinary teams encouraged. Innovative design ideas for a four-acre park and harbourwalk. The landscape will incorporate various architectural pavilions, a carousel, community facilities and dock master's offices. Registration by 19 October 1996. Submissions by 15 November 1996. Professional advisor: Wendy Evans Joseph AIA.
Tel: +516 477 3000.
Fax: +516 477 2488

EXHIBITIONS

AUSTRIA
Feed and Greed. Until 28th July, 1996. Examples of work from the fields of Fine art, Applied art, Medicine and Technical History. MAK, Austrian Museum of Applied Arts. Stubenning 5, A-1010 Vienna, Austria. Contact Gabriele Fabiankowitsch.
Tel: +171 136 298

Josef Hoffmann and the Wiener Werkstätte. Travelling Exhibition: Toyota, Sakura, Tokushima.

Until 18 August 1996. Presenting Josef Hoffmanns' activities before and after 1900.
MAK, Austrian Museum of Applied Arts. Stubenning 5, A-1010 Vienna. Contact Gabriele Fabiankowitsch.
Tel: + (1) 71 136 298

CANADA
Frank Lloyd Wright: Designs for an American Landscape, 1922-1932. Until 22 November 1996. Contact CCA 1920 rue Baile, Montreal, Canada.
Tel: +(1) 514 9397000

DENMARK
Behind the Hedge: the Danish one-family house. 18 August 1996. Dannsk Arkitecktur Centre, Gammel Dok, Copenhagen, Denmark. Tel: +45 315 71 930

FRANCE
New Architecture in Flanders. 24 November 1996. Arc en reve, centre d' architecture, entrepot, 7 rue Ferrere, Bordeaux, France.
Tel: +33 1 42 76 33 97

Additions d'architecture: 1+1=1 August 1996. Pavillon de l'Arsenal, 21 boulevard Morland, Paris, France.
Tel: +33 1 42 76 3397

THE NETHERLANDS
The Modern Fifties and Sixties Until 7 July 1996. Netherlands Architecture Institute, Museumpark 25, 3015 CB Rotterdam.
Tel: +31 10 440 12 00. Fax: +31 10 436 69 75

Real Space in Quick Times Architecture and Digitization. Dutch entry for the 19th Milan Triennale. 15 June-15 September 1996. Netherlands Architecture Institute, Museumpark 25, 3015 CB Rotterdam, The Netherlands. Contact: Claire Beke at the NAI Communications Department.
Tel +31 440 12 55

SWEDEN
The timber prize 1996
Until 1 September1996. Arkitecktur Museet, Skeppsholmen, Stockhom, Sweden.
Tel: +468 666 4900

SWITZERLAND
Hermann Czech 11 August 1996. Architeckturmuseum in Basel, Pfluggässlein 3, Basel, Switzerland. Tel: +41 612 611413

Inés Lamuniére/Patrick Devanthéry. Until 27 July 1996. Architekturgalerie Luzern, Rosenberghöhe 4, Luzern, Switzerland.
Tel: +41 41 4106214

Luigi Snozzi: Auf den Spurenn des Ortes. Until 28 July 1996. Museum für Gestaltung, Ausstellungssrasse 60, Zürich, Switzerland. Tel: +41 14 462211

UK
Bridging the City
29 September-8 December 1996. Photographs, models and drawings will complement a spectacular "river of time" documenting the development of the Thames. Royal Academy of Arts, Piccadilly, London W1V ODS, UK.
Tel: +44 171 494 5615.
Fax: +44 171 439 4998

CD Partnership – "Design put to work to make places that are alive". Until 19 August 1996. Design Museum, Shad Thames, London, SE1 2YD. Tel: +44 171 403 6933. Fax: +44 171 378 6540

USA
Philip Johnson Until 3 September 1996. An exhibition to celebrate this architect's ninetieth birthday and his role as a curator and donor to the museum. MOMA in New York.
Tel: +212 708 9400

Building for Air Travel: Architecture and Design for Commercial Aviation. 19 October-7 January 1997. The Art Institute of Chicago, 111 South Michigan Avenue, Chicago, Illinois 60603-6110, USA. Tel: +312 443 3600.
Fax: +312 443 0849

TRADE SHOWS

AFRICA
INTERBUILD AFRICA
20-25 August, 1996. Exhibition Centre, Johannesburg, South Africa. Contact Specialised Exhibitions (pty) Ltd, PO Box 2900, Johannesburg, South Africa.
Tel: +27 11 8351565.
Fax: +27 11 4961161

AUSTRALIA
Interbuild – International Building and Construction Exhibition 21-24 July, 1996.
Australian Exhibition Services Ltd, Illark Plaza, 424 St Kilda Road, Melbourne, Vic 3004, Australia.
Tel: +61 3 867 4500.
Fax: +61 3 867 7981

CHILE
ESPACIOS - Built Spaces
3-7 July, 1996. Exhibition Centre, Santiago. Punto Diez SA, Los Conquistadores 1956, Casilla 21-9 Providencia, Santiago, Chile.
Tel: +56 2 2316515.
Fax: +56 2 533 1667

CHINA
'96 China International Construction Survey, Design and Interior Decoration Exhibition. 27 -30 August 1996.
Exhibition Centre, Beijing, China. Tel: +86 10 505 1585.
Fax: +86 10 505 1582

Building China. 2-6 July 1996. Building Exhibition Centre, Beijing. Contact: Adsak Exhibition Services Ltd, 14/F Devon House, Taikoo Place, 979 Kings Road, Hong Kong. Tel: +852 2811 88 97.
Fax: +852 2516 50 24

GERMANY
CONSTRUCTEC '96
7 November 1996. Leading international construction market show will include a special "Europe Symposium". Hannover Fairs Information Centre, 25 Hurst Way, South Croydon. CR2 7AP, UK.
Tel: +44 181 688 9541.
Fax: +44 181 681 0069

INDONESIA
INDOBEX 25-28 September, 1996. International Building and Construction Expo. Jakarta Convention Centre, Jakarta, Indonesia. Contact: David Aitken. Reed Exhibitions, Oriel House, 26 The Quadrant, Richmond, Surrey, TW9 IDL, UK.
Tel: +44 181 910 7744.
Fax: +44 181 910 7749

KAZAKHSTAN
KAZBUILD '96 – 3rd Building and Construction Exhibition 18-21 October 1996. Atakent International Exhibition Centre, Almaty. Contact: Rebekah Alvord, International Trade and Exhibitions, J/V Ltd, 112a Shirland Road, London, W9 2EQ, UK. Tel: +44 171 286 9720.
Fax: +44 171 286 0177

THAILAND
THAIBEX '96. The 6th Thailand International Building and Construction Exposition. 4-7 September 1996. Queen Sirikit National Convention Centre, Bangkok, Thailand. Contact: David Aitken. Reed Exhibitions, Oriel House, 26 The Quadrant, Richmond, Surrey, TW9 IDL, UK. Tel +44 181 910 7744.
Fax: +44 181 910 7749

Country Report

Roberto de la Fuente

Chile

Despite the bombardment of nineties image-culture and the influence from the United States of America and Europe, this "long thin country" on the Pacific coast of South America is reasserting its national identity. With its stable economy and rich material resources, Chile can offer the investor a foothold in a colourful continent whose origins can be traced from Pre-Colombian indians to the conquistadors. Jorge Eguiguren provides an insight into his country's aspirations for the future and the practical measures that have been taken to realise them.

Foreign investment schemes

Chile's dynamic location in the "Pacific Ring of Fire", is partially responsible for its explosion onto the international scene as the only country in South America to be a member of APEC (Asia Pacific Economic Co-operation) and first in line to join NAFTA (North American Free Trade Agreement).

With a healthy average economic growth of 6.7 percent in the last ten years the Chilean government has stepped up its development programme.

Foreign investment is actively encouraged through the Concession System, introduced in 1993, which enables both national and non-national private investment into airports, highways, seaports and water infras-

Opposite page *World Trade Centre, Santiago by Sergio Amunategui.* ***Below, clockwise from top left*** *Williamson Balfour bottling plant in Chile's central valley by Guillermo Hevia; US Embassy, Santiago by Leonard Parker Associates; Edificio Compañia de Telefonos de Chile, Santiago; Aeropuerto Pudahuel, Santiago by PAL Architects*

Eduardo Modolo

Roberto de la Fuente

Roberto de la Fuente

tructures. Under this system the private sector acts as investor and developer of a project and is granted exclusive rights to operate the project for a limited period post completion. The public sector acts as regulator.

For example, in 1995 the consortium Endesa-Delta-Agroman completed the United States' US$42 million Melon Tunnel in the V Region. The consortium will collect tolls for the next 21 years from the tunnel which takes the Pan American Highway through the El Melon mountain saving motorists a tortuous and time consuming climb.

"The addition of Terminals 2 and 3 to the newly opened Santiago airport is a project presently under consideration for inclusion in the Concession System", says Alberto Montelalegre an architect with PAL, the Chilean-French joint venture responsible for the design of Terminal 1 (completed in 1994) and the overall masterplan for the airport. On completion the airport's Terminals 1, 2 and 3 will have a capacity of 9 million passengers per year.

Industry and architecture

With economic growth has come an increased awareness of the importance of industrial architecture and corporate identity. "In the last ten years there has been a revolution in industrial architecture with its roots in the booming fruit export business", says Guillermo Hevia, a leading industrial architect. Several of Hevia's buildings run alongside the route of the Pan-American Highway awaiting their cargo. Hevia's design of Williamsom Balfour's bottling plant (an Inchcape subsidiary) mixes a softly curving roof with the long horizontal lines of the building and strong bright colours, including the green of the landscape.

The market has met the increased demand of businesses for modern industrial units by developing industrial estates designed with the requirements of end users in mind. One of the largest developments of this kind is planned for the Metropolitan region, to the north of Santiago. Architects Cristian and Fernando Boza, together with the US architects Hellmuth Obata and Kassabaum, are at present designing a 1000 hectare industrial estate in the area.

Top left *Casa Caracola, Santiago by Enrique Browne, one of Chile's best known architects.* ***Top right*** *Royston, Hanamoto, Alley and Abey landscaped the 200-acre Parque del Recuerdo, Santiago with Duvall Design. The entire project was produced in the US and air freighted to Chile. Five of the US team who specialise in tensile structures went on site for installation.* ***Left*** *Community housing, Santiago by San Martín, Wenborne, Pascal. The reintroduction of the brick was influenced by the architect Fernando Castillo, Minister for Housing from 1964-70.* ***Below*** *The European Organisation for Astronomy is building the largest and most powerful telescope in the world on top of Cerro Paranal in the Atacama desert, for the European Southern Observatory, at a cost of US$600 million. They levelled the site by cutting 28 metres off the top of the Cerro to provide a flat area approximately the size of five football fields. Although the clear skies made this a good location, the constant seismic activity in the Andes presented a problem. The concrete foundations withstood a recent earthquake and although office equipment was thrown to the floor, the telescope was not shaken out of alignment*

Opposite page *On his own recently completed house, De Groote displays his refined use of geometry. The core of the house comprises a double cylinder where one cylinder is placed inside the other, the cylinder's centres being shifted slightly out of line. The area between the two cylinders contains the stairs that connect with the house's five storeys*

European Southern Observatory

However not all of Chile's current architectural activity is new. "There is still a desire to maintain the historic memory of important buildings" explains Cristian Fernandez, the architect presently engaged in the regeneration of a 45 hectare disused railway depot in San Bernardo, a satellite city to the south of Santiago.

The regeneration has been brought about by a combination of Chilean and Malaysian investment. Existing buildings at the depot will be converted into a variety of public amenities, including a shopping centre, a sports centre, a train museum and a school. Surrounding this central heart there will be a residential development – buildings of up to six storeys running alongside the main roads, and single storey housing built alongside the tributary roads.

Santiago

Santiago, the engine which drives the economy, has a dramatic new face. The recently completed Torre Los Andes, an office building in the financial heart of Santiago, has pushed the city skyline upwards. The building's 27 storey tower makes it the tallest building in the business district, at 92 metres. One of the problems faced by its architect, Cristian Fernandez, was that of trying to keep the building cool in the long summer, whilst keeping energy costs low. Fernandez's solution was to "incorporate a series of glass eaves on the curtain wall of the north facade of the building thereby shading the facade from the sun without losing the transparency of the glass facade" he explains.

The newest addition planned to grace the Santiago skyscape is the Compania de Telefonos de Chile Tower situated between the city centre and the bohemian barrio El Bosque. Once completed the tower's fibre optical lit rhomboidal structure will blaze a trail on the night skyline.

Not adverse to change the five million Santiaguinos are also altering their living habits. Residential apartment developments are big business in the barrios of Providencia and Las Condes. As Fernandez says "the conservative Chilean family has been effected by the change in the country. The young Santiaguinos are leaving the family nest earlier and this has generated a growing demand for small one- and two-bed apartments". Larger apartments are sought by couples whose children have left home and who find that the security and relatively low running costs of an apartment are more attractive than maintaining a detached house and garden.

The working class has emerged as the most active sector looking to move to new houses. The demand for this type of housing has taken the south of the city by storm and an increased service network has been planned with a new line to the Metro network under construction, now that the Plaza Vespucio Shopping Mall and the San Damian School (designed by Manuel Moreno) have been completed.

For the typical Chilean family the detached house is still the favourite choice. For the better-off, the practices of Undurragaa-Deves (winners of the Palladio award with their Casa El Cerro, a stone walled house reminiscent of a dam), Enrique Browne (an architect fascinated with the symbiotic relationship between nature and architecture) and Christian De Groote (who, over the last 30 years, has accumulated a portfolio that would be difficult for any architect to emulate) are popular and strong choices. WA

US firm in Chile

Callison – exercising patience

Chile, "South America's tiger" is a small country with big ambitions. However, as Callison's Stan Laegreid and Richard Meyer admitted to Steve Daniels, this North American firm has discovered that the country's flamboyant economic success does not necessarily translate into instant architectural gratification.

In Chile there are surprisingly few commercial projects by foreign designers. Despite a four and a half year presence in the country, Callison is just starting to show results in terms of built products. The firm's role in South America has, thus far, been one of consultancy, not traditional architecture. "South America", sighs Callison's Stan Laegreid, who is responsible for the firm's South American business development, "has been an exercise in patience".

But the rising income of Chile's growing middle class is fueling the country's lust for Miami Beach-like commercial properties – banks, shopping centres, offices, and commercial design – which is what Callison does best. The "Callison culture", which has promoted intimate and long-lasting relationships with clients like Microsoft and Nordstrom, both Seattle neighbours, may prove the perfect fit for Latin America. "The Chilean business community is very much a social organisation" says Richard Meyer, the Callison principal who oversees South American projects.

"One of the reasons we think we will be successful in Chile is our experience in regionalising projects" says Laegreid. "A case in point is the Nordstrom stores, each of which takes on, or reflects, the identity of the particular locale in which it is built." Callison has designed 75 stores for Nordstrom, America's leading fashion retailer, and is currently creating five new stores per year. While materials and construction details are consistent from project to project, design elements vary to bring uniqueness to each project. "Most of our more sophisticated clients in Chile appreciate that," says Laegreid, "and to some degree, the reason we have been successful in establishing relationships in Chile is our ability to pay homage to settings and surroundings."

A case in point is Plaza la Serena, a planned two-storey enclosed shopping centre to be anchored by two department stores and a six-screen cinema in the destination resort on the Pacific coast northwest of Santiago, Chile's capital. La Serena is one of a half-dozen Callison projects in Chile, but one of only two in which Callison functions in a traditionally architectural role – that is, in which it is executing building design.

"La Serena will be the most exaggerated of the Chilean projects stylistically," says Laegreid. "Our work there takes on more of an historical quality and reflects the scale and texture and detailing of the region, one rich in the tradition of Spanish Colonial architecture."

At La Florida, a booming suburb of Santiago, Callison has assumed a different role. The US design firm will plan and design the expansion of the Plaza Vespucio, a regional shopping centre anchored by Falabella, Chile's largest retailer. Plaza Vespucio will be linked with the capital upon completion of the northerly extension of Santiago's subway system. The plaza, a multi-level galleria will include retail shops, restaurants, entertainment complexes and will be linked to the subway terminal underground. Eventually, the project will include a civic campus and public buildings. "Our role in Plaza Vespucio and in the connected La Florida master plan was to look at the total package of retailing and commercial uses that might be projected for an entirely new commercial core,"

"the reason we have been successful in Chile is our ability to pay homage to settings and surroundings."

Opposite *Plaza la Serena in La Serena – a planned two-storey enclosed shopping centre to be anchored by two department stores and a six-screen cinema. One of the two buildings in Chile which Callison has designed.*
Below *Apumanque shopping centre, Santiago. Evidence that Chile's "shopping" culture is based on "retailing trends and business strategies"*

Opposite *Design for the interior of the Banco de Chile. Callison's North American influence is evident in what Meyer describes as the "cowboy culture" of Latin America embodied in Chilean banks.* ***Below*** *Banco de Chile. Callison is working on design and space-planning issues but also as a consultant on merchandising concepts*

says Laegreid. "We have provided a mix of projected tenants and uses which complement the existing centre, and we have tried to basically create a new city core."

Its association with Falabella has Callison working in Lima, Peru to work on the Plaza San Isidro, a proposed two-block mixed-use project that will include new department stores and a shopping centre and, eventually, a 300-room hotel and two 20-storey office buildings. "If you can develop relationships in the country that is the regional leader, those relationships can take you to other places," says Meyer. "We are seeing it happen in Chile, and the Peruvian project is evidence of that."

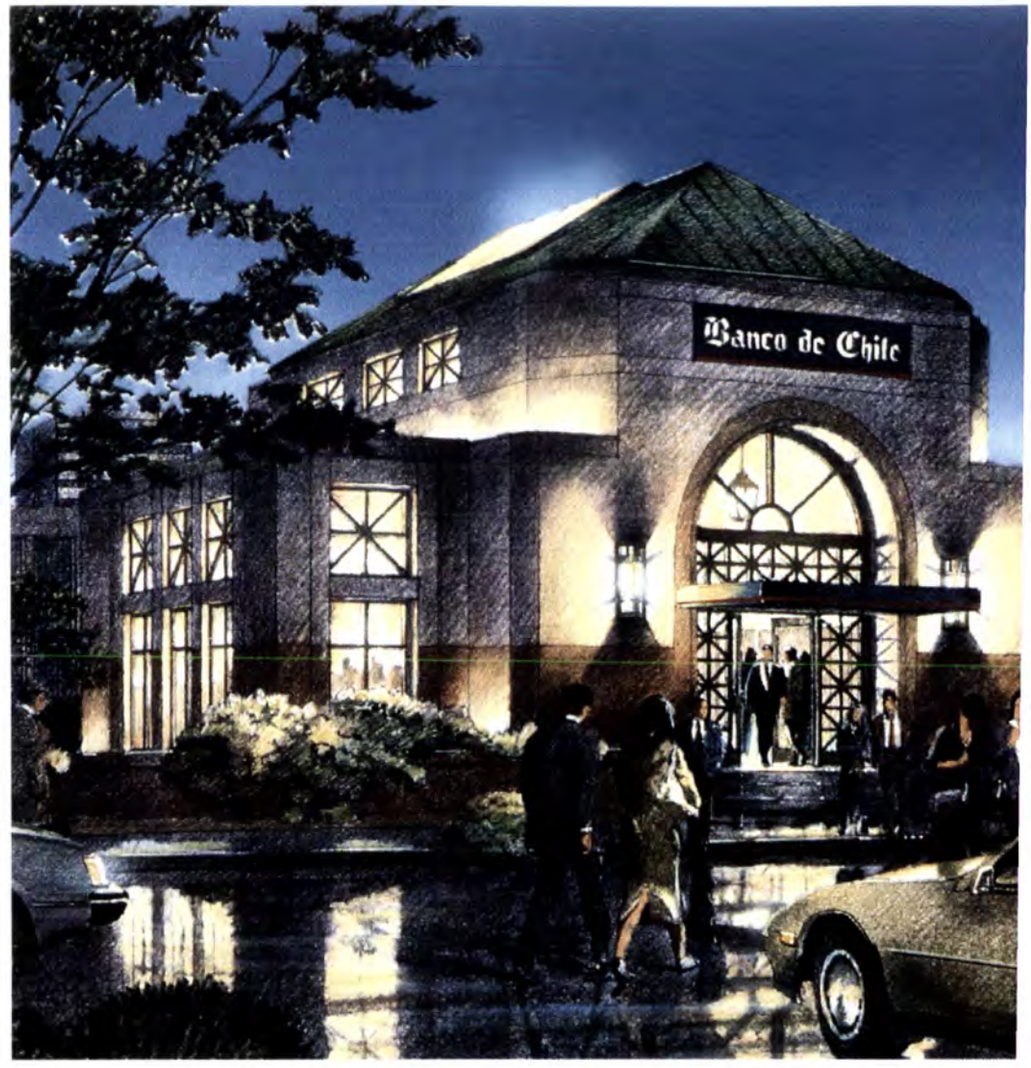
Callison's Chilean revenues are projected to nearly double in the coming year to about US$1 million, between two and three percent of the firm's annual fees.

Callison entered Chile as a result of its relationship with the North American DeBartolo family, owners of the National Football League San Francisco 49ers whose business interests include shopping centres and malls throughout the US. DeBartolo was hired to rejuvenate the enclosed two-level Apumanque shopping centre in downtown Santiago, the city's oldest. The new mall would be extended to three levels, 400,000 square feet, with a new level of food retail, entertainment and parking.

"DeBartolo was asked for the names of five US architects, all of whom were interviewed over the course of a week," says Laegreid. "All were knowledgeable in retail design. We won the job because we were gracious hosts. Others met owners, pitched them and walked them out the door; we took them to dinner, showed them around town and worked at developing a relationship. That is an important consideration in Latin America. In Asia, clients take you out to dinner as a formality, not because they like you. In Latin America, by contrast, social connections become an integral part of the business relationship."

"We are a firm that develops relationships", says Callison publicist Eric LeMay. "We market to clients," says Meyer, "not projects."

"Chileans want expertise," says Laegreid, "but that is not the driver of the relationship with the architect. Only relatively late in the game in Chile, do conversations get around to costs and fees. These are savvy business people – don't get me wrong – but social issues are critical in this environment."



While considering the renovation of Apumanque, Callison met other Chilean owners, "people who heard simply that we were there," says Laegreid. "Those introductions led to ongoing relationships. Again, in Asia, the approach is 'We have a project; we would like to talk to you.' In Chile, it is 'We would like to meet you.' A relationship might be fostered over a year or two in Chile before you even talk about a project."

Opportunities are just now emerging in Chile for "architectural features," says Meyer. "Until recently, the building context was infrastructure and industrial – this benefited the Fluors and the Bechtels, but not the architectural community. Fluor, with an emphasis on mining, metals and petroleum, has been in Chile since the 1960s and incorporated in Santiago as Fluor Daniel Chile SA in 1978. Now that Chile is turning to retail development and state of the art methodology, "they turn to us to tell them what state of the art is," says Meyer. "They, thus, are asking not architectural questions, but broad questions about retailing trends and business strategies."

Chilean banks, for instance, still embody what Meyer calls the "cowboy culture" of Latin America. Iron grates cover the doors and armed, uniformed sentries guard the entries. Callison is working with Banco de Chile on design and space-planning issues, but also as a consultant on merchandising concepts. Only when Banco de Chile approves the concepts, will they be applied to actual projects.

Which leads Meyer to a discussion of architecture as a commodity based on price

"Chileans want expertise," says Laegreid, "only relatively late in the game in Chile, do conversations get around to costs and fees. These are savvy business people – don't get me wrong – but social issues are critical in this environment."

and a trend which, at least in the US, has had the effect of shrinking the role played by architects in the construction process. "What Callison has done very well," says Meyer, "is to expand the role of the architect beyond signature architecture."

"If you are talking about banking, we have people here who can talk about how to bank," says LeMay.

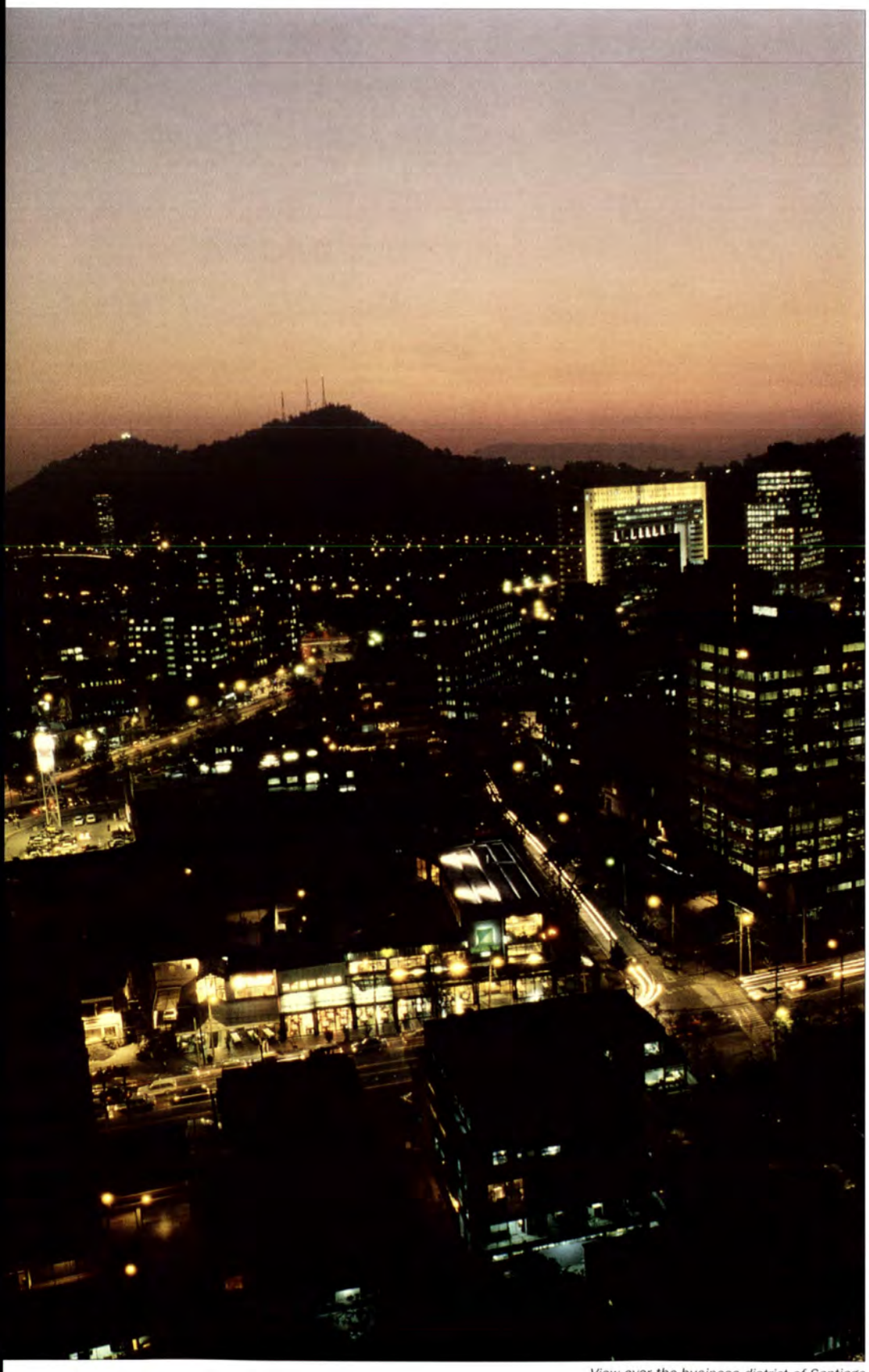
"Chile," says Meyer, "lends itself to that point of view, and our success (Callison is now the fourth largest US architectural firm and the eighth largest architectural practice in the world) is a testimonial to the effectiveness of our corporate mission. Architecture is not just about making beautiful buildings. It is about how to conduct better business. Our paradigm works and the culture in Chile is very receptive to that."

"Having said all this about the advantages of being service-oriented, let me add that the Chilean community is still not used to knowing how to pay for that. Our consultancy role is unfamiliar to them," says Meyer. Architectural fees are more typically billed as a percentage of construction costs. In fact, Colegio de Arquitectos de Chile has charted what might be typical fees and costs as a service to owners unfamiliar with hiring architects. "They are intended as guidelines to give some comfort to clients who have not worked with the architectural profession. But the fact that they work from this document only amplifies the difficulties for those selling conceptual ideas ahead of design.

Chile taxes imported labour and services at a flat rate of 20 percent and imposes an indirect 18 percent value-added tax on sales and services, which "in a couple of cases we have found passed on to us," says Meyer. "Now, our contracts specify a net figure and we ask to be paid in American dollars." On the other hand, say Callison employees, monetary exchange is easy in Chile, most businessmen speak English, and bureaucrats with their hands out are almost unheard of. "We have not had to confront that at all," says Meyer. "Chileans pride themselves on their level of honesty."

Unlike Vietnam, to which US engineers and designers have turned with enthusiasm since the Clinton administration's easing of a two-decade-old trade embargo, but which is still focused on infrastructure needs, Chile has already raised its game to a higher level, and Callison is about to roll up its sleeves. WA

Building in Chile



Roberto de la Fuente

View over the business district of Santiago

GENERAL INFORMATION

Chile occupies a narrow strip of land on the south-west coast of South America. It stretches 4,200 kilometres to Cape Horn, but is only 430 kilometres at its widest point, and has a land area of 756,950 square kilometres. Chile borders the Pacific Ocean on the west and south and its coastline stretches for over 6,000 kilometres. It borders Argentina and Bolivia to the east. Peru lies to the north. The terrain is mountainous with low coastal mountains and the Andes mountains on the eastern border, which form a fertile central valley. There are numerous islands along the southern coast.

Located along one of the active zones in the earth's crust, the "Ring of Fire", Chile is subject to powerful earthquakes. There are numerous volcanoes in southern Chile.

Climate: There are three main climatic regions in Chile. Northern Chile has an arid climate. The central region has a Mediterranean climate with warm, dry summers and mild dry winters. This region has the fertile pampas and is the population centre of the country. The South has a cold and damp climate. Southern Chile has dense forests, lakes, snow-covered peaks and glaciers.

Average Temperatures (minimum/maximum)

	January	July
Santiago	12°/29°C	3°/15°C
Valdivia	11°/23°C	5°/11°C

Precipitation: Precipitation varies depending upon the climatic region. The annual average precipitation is 365 millimetres in Santiago and is 2,700 millimetres in Valdivia.

Population: Approximately 86% of the 14.1 million population live in urban areas. The population density is 18 people per square kilometre.

Language: Spanish is the official language and is spoken by nearly all the population.

Ethnic Composition: Mestizo (mixed Indian and European ancestry) 66%, Spanish 25%, Indian 5%.

Capital: Santiago.

Economic data
The Chilean economy continues to improve since returning to a democratic government in 1990. Inflation has slowed from nearly 30% in 1990 to under 10% in 1995.

Consumer Price Index: 1990=100

1991	1992	1993	1994	1995(est)
121.8	140.6	158.6	176.6	190.0

Exchange Rates: Pesos per US$

1991	1992	1993	1994	1995	1996
374.5	382.1	428.5	402.9	407.1	411.6

TRAVEL INFORMATION

Time Difference: Chile is four hours behind Greenwich Mean Time (GMT) and one hour ahead of Eastern Standard Time (EST).

Currency: One Chilean Peso (Ch$) divides into 100 centavos.

Business Hours:

Government:	9:00-12:00 and 2:00-5:00, Monday-Friday
Banks:	9:00-4:00, Monday-Friday
Business	8:30-12:30, 2:00-6:00, Monday-Friday 8:30-12:30, Saturday

National Holidays:

January 1	New Year's Day
May 1	Labour Day
May 21	Battle of Iquique
June 29	Sts Peter & Paul
August 15	Assumption Day
September 11	Liberation Day
September 18	Independence Day
September 19	Armed Forces Day
October 12	Day of the Race
November 1	All Saints' Day
December 8	Immaculate Conception
December 25	Christmas Day

The following days are observed on different dates each year. They change yearly in accordance with the lunar cycle.

March-April	Good Friday
March-April	Holy Saturday
April-May	Corpus Christi

Airport Information: Comodoro Arturo Merina Benitez Airport is about 6 kilometres from Santiago.

Dialling Code: Chile's dialling-in code is 56 and the international dialling-out access code from Chile is 00.

GENERAL CONSTRUCTION INFORMATION

Construction Outlook: The construction industry's growth began slowing over the past couple of years. The near term prospects for the industry are good. The projected public and private infrastructure spending from 1996 through 1998 is over US$14 million. Projections are for continued growth in the housing sector. Overall, the prospects for the construction industry remain bright through to the end of the century. Projections are for the industry to grow faster than the general economy, fuelled by continued foreign investment.

Rates of Inflation: Estimates of 1996 inflation for the construction industry are between 8 and 10%.

Procurement/Forms of Contract: Historically, lump sum tendering is typical for most construction contracts, public and private sector. However, during the past several years there has been a growth in other procurement options in the private sector: cost plus fixed fee, design/build, construction management. Bills of Quantities may be used on some public sector contracts.

The Chilean construction industry uses General Contracting over Trade Contracting. Speciality work is sub-contracted. Drawings are generally 100% complete at tender. A four to six week bid period is typical. The construction contract may be administered by the architect or a consultant appointed by the owner.

CONSTRUCTION MATERIALS AND METHODS

Favoured Construction Materials: Most office buildings use a reinforced concrete frame. Industrial partitions are mostly masonry with a skim coat of plaster. Designers must consider severe earthquake forces since Chile has a high risk of earthquakes.

Availability: Most construction materials are available locally. Marble and other manufactured special exterior closure materials (eg. insulated metal panels) are imported. Skilled and unskilled labour are plentiful. A wide range of construction equipment is available.

CONSTRUCTION COST GUIDES

Pricing Manuals: ONDAC publishes *El Manual de la Construccion* monthly. It provides some in-place unit rates and material costs. For more information contact ONDAC at tel: + 56 2 635 2133 or, fax: + 56 2 635 6380.

USEFUL ADDRESSES

Camar Chilena de la Constuccion
Marchant Pereira No. 10
Santiago, Chile

Institito Chileno del Cenento y Del Hormigon
Pio X 2455
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Colegio de Arquitectos de Chile
Av. Libertador 8000 O'Higgins 115
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Santiago, Chile
Tel: + 56 2 639 87 44
Fax: + 56 2 639 87 69

Colegio de Ingenieros de Chile A.G.
Av. Santa Maria 0508
Santiago, Chile

World Architecture and Hanscomb wish to thank Simon-Cade of Chile for assisting in the presentation of the information in this Country Report.

Approximate Construction Costs
The following square metre unit rates are provided for rough comparison purposes.

	Pesos/square metre
Office building with tenant fit out	350,000-400,000
Hotel	415,000-475,000
Apartment Building	325,000-375,000
Industrial Building	175,000-200,000

Chile – Major architectural practices/design firms

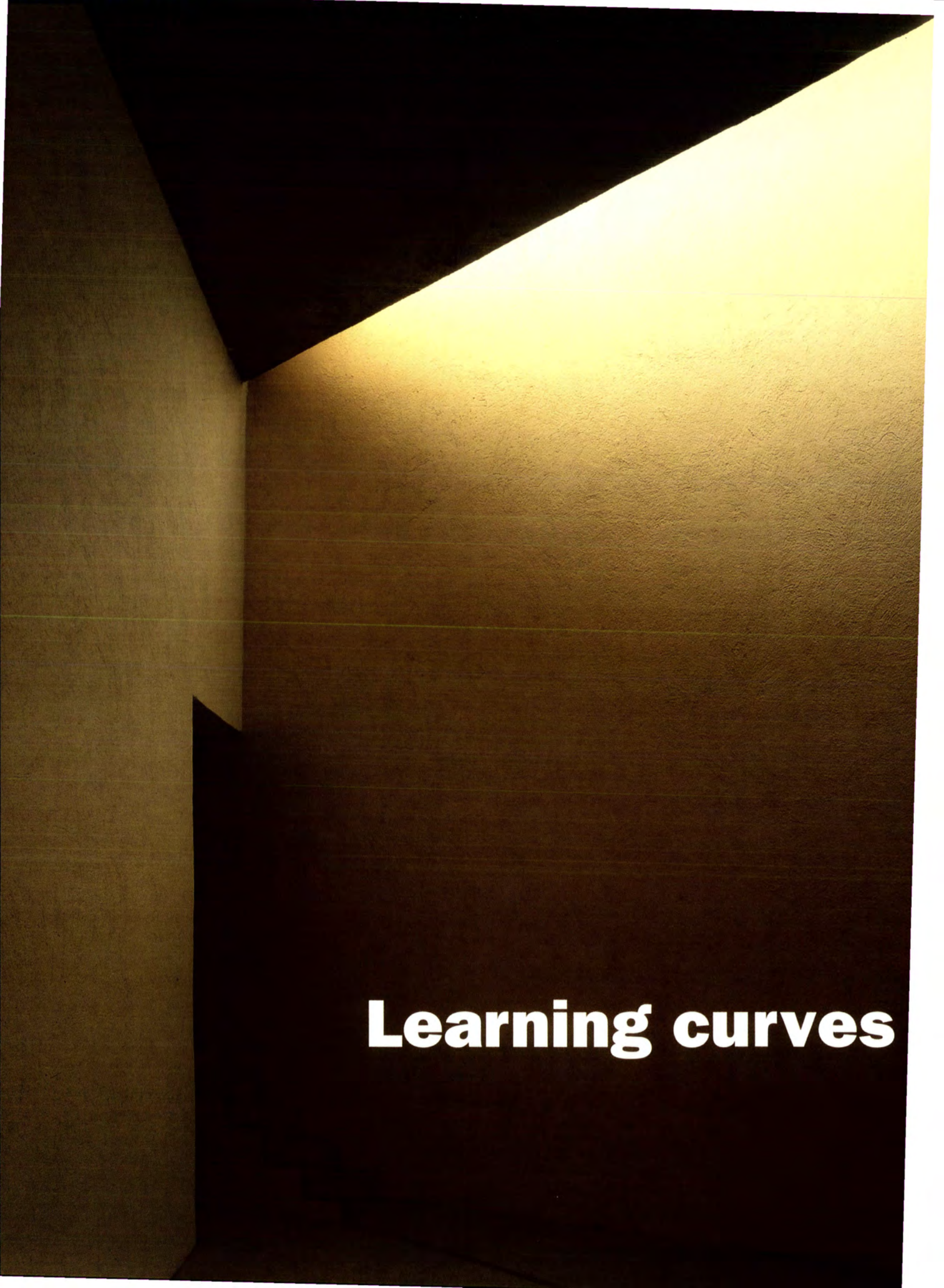
This table was compiled with information supplied by the practices listed.

Architectural practice / design firm	Total architects	Total staff	Total offices	Area of Specialisation: Health care	Industrial	Commercial	Office buildings	Housing / Residential	Planning	Interiors	Sport / Leisure / Recreation	Hotel / Restaurant	Education	Laboratories / Research	Transport	Other
Archiplan	9	20	1		•		•	•								
Ardeco Ltda	1	7	1				•	•								
Constructora Ariplan Limitada	2	4	1					•								
Arquitaller Limitada	3	10	1													•
Asesoria e Inversiones E.B. Limitada	6	12	1				•									
B y B Arquitecto Limitada	2	8	1		•											
Baixa y Del Rio	2	3	1	•	•	•	•	•	•	•	•	•	•	•	•	•
Balze Arquitectos	4	6	1	•	•	•	•	•	•	•	•	•	•	•	•	•
Bannen Lanata Pedro	1	1	1											•		
Baus y Schmauk	3	6	1		•	•		•								
Bel Arquitectos Limitada	4	6	1						•							
Bendersky Smuclir Jaime Arquitectos	5	10	1				•									
Boetsch Garcia - Huidobro Hugo	3	4	1					•								
Bolumburo Sergio	1	3	1					•								
Bonnefoy Grossetete Raul	1	20	1					•								
Carlos Elton Bulnes y Asociados Arquitectos	4	10	1					•								
Camus Barros y Rotas Limitada	3	9	1					•	•							
Cortes y Onfray Arquitectos	4	7	1		•											
Cristian Boza y Asociados Arquitectos	13	15	1	•	•	•	•	•	•	•	•	•	•	•	•	
Sociedad Cardenas Covaceviz Zarru Arquitectos Ltda	5	12	1			•		•								
Chavarri Del Campo Jesus Arquitectos Asociados	6	25	1		•											
Carlos de Landa Concha	3	6	1					•								
Constructora LD Limitada	1	4	1				•	•								
Sociedad Carlos Alberto Cruz	11	40	1				•									
Christian de Groote Arquitectos Limitada	4	25	1			•										
Del Fierro - Carmona - Vilche Arquitectos Asociados	4	9	1		•			•								
Desarrollo y Gestión de Proyectos Limitada	4	20	1		•							•				
Juan Honold Dunner y Asociados	4	12	1						•							
Ediciones Arq	3	6	1		•			•								
Empresa Constructora Ayp	1	3	1					•								•
Estudios y Proyectos	2	3	1													•
Fernandez Cox Cristian y Asociados Arquitectos	2	7	1					•								
Flano Nunez Tuca Arquitectos	13	15	1				•	•								
Ivan Codoy Grancelli y Asociados	5	7	1													•
German del Sol Arquitecto & Asociados	3	5	1					•				•				
Gubbins Labe Arquitectos	8	10	1	•				•	•							
Hales Dib Patricio A.	2	5	1						•							
Veyl Galvez Hernan	1	1	1					•								
Malsch Horstmann Walter	2	4	1					•								
Iglesis Prat Arqutectos Limitada	10	12	1				•	•								•
Inagro SA	8	20	1				•	•	•							

Chile – Major architectural practices/design firms

This table was compiled with information supplied by the practices listed.

Architectural practice / design firm	Total architects	Total staff	Total offices	Area of Specialisation: Health care	Industrial	Commercial	Office buildings	Housing / Residential	Planning	Interiors	Sport / Leisure / Recreation	Hotel / Restaurant	Education	Laboratories / Research	Transport	Other
Izquierdo Lehmann y Companiá	6	12	1					•					•			
Jimenez Marín Arquitectos	2	8	1		•											
Justiniano y Meyer Arquitectos Limitada	2	7	1			•	•									
Korn y Pesce Arquitectos	2	4	1					•								
Krebs Bade Norberto	2	4	1					•								
Link Kuperman Marcos	2	10	1				•									•
Luis Emilio Gomez Lerou	1	1	1					•								
Maldonado Frindt Arquitectos Limitada	5	10	1					•	•							
Mardones Arquitectos Asociados Limitada	5	20	1				•	•								
Claudio Lopez De La Maza	2	4	1						•				•			
Juan Lund Arquitectos	2	4	1										•			
Fernando Merino De La Cerda	2	4	1					•				•				
Michaeli Oberhauser Sepp	2	4	1					•								
Antonio Monroy Montero	1	6	1					•								•
Alex Moreno	4	8	1		•				•							•
Oscar Navarro y Eduardo Suarez	5	7	1		•	•	•	•								
Marcelo Etcheverry Orthous	1	4	1					•								
Palma Irarrazabal M. Angelica	5	10	1	•	•	•	•	•	•	•	•	•	•	•	•	•
Mario Paredes y Arquitectos Asociados	7	14	1				•	•				•				
Patino Gonzalez Jorge E.	1	1	1													•
Pazols Jiron Osvaldo	1	3	1					•								
Perez de Arce Antonicich Mario y Asociados	7	10	1						•						•	•
Penafiel Edward Jose D.	4	7	1					•								
Javier Pinto Pico	3	3	1					•								
Profesionales Asociados	8	25	1			•		•								
Ramon Del Piano Perez	1	4	1													•
Pedro Iribarne Rios	2	6	1						•							•
Juan Sabbagh y Compañía Limitada	25	35	1		•	•										
Salomon Cammi Ava Yu	2	5	1					•								
San Martin y Pascal Arquitectos	15	28	1				•	•	•							
Schapira Eskenazi	3	15	1				•	•								
Guillermo Schenke y Compañía Limitada	1	6	1	•				•								
Patricio Schmidt y Leonardo Valdes Arquitectos	8	18	1				•	•								
Senerman Lamas Abranam	15	200	1				•	•								
Sergio Alemparte	36	42	1													•
Sistemas y Proyectos Constructiuos S.A.	2	6	1		•											
Sociedad Constructora Los Andes	5	40	1					•								
Mario Teran y Asociados Arquitectos	3	14	1				•									
Undurraga y Deves Arquitectos Limitada	4	7	1					•					•			
Velez y Asociados Arquitectos	4	10	1					•				•				
Jose Zambrano	4	16	1				•									•



Learning curves

Projects

Chile has a long tradition of a strong austere and assertive modern educational architecture which dates from the creation of the Building Society for Educational Facilities in 1937. Gustavo Ross, Minister for Economy and Claudio Matte, Minister for Education were responsible for this during the government of President Alessandri, and it marks the start of a flourishing period for school building nationwide.

Educational institutions became one of the gateways to modernism. Echoing the new rational approach to education, the state architecture system reflected modern academic principles. Hesitating between streamlined Art Deco and candid rationalism, the first schools, designed by architectural practices such as Aracena y Monckeberg and Zacarelli, Gacitúa y Barbieri, represented an important challenge for the modernisation of national institutions generally and testify to the substantial interest that the state has shown in education in the past.

The state educational policy was influenced by the concept of the Welfare State (1925-73) until the arrival of the "Enterprise State" (1973-1996). Today the Democratic Goverment keeps the concept of neo-liberalism in all social policies. In education, the state used funds from the national public schools for city councils (Municipalidades) and health facilities. Moreover, under General Pinochet, the government privitisation schemes led to laws encouraging private investment in education. Private universities and private polytechnic institutes emerged for the first time. Under the new liberal government, the state budget for new education buildings is now almost zero.

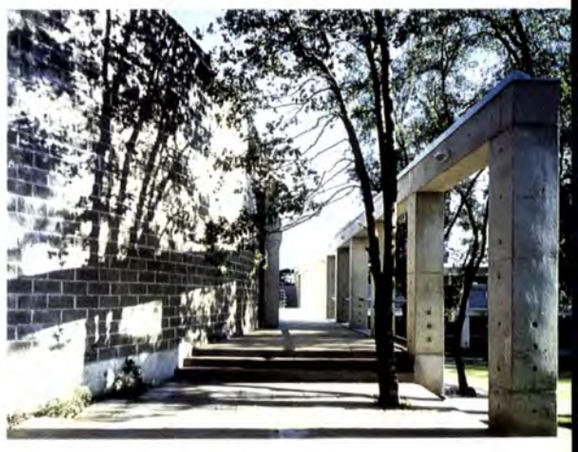
Fundacion DUOC is a Polytechnic High School located in the city of Viña del Mar (120 kilometres west of Santiago). DUOC stands for the "Departamento Obrero Campesino de la Universidad Catolica" (Department of Rural Affairs, Catholic University) created in the 1960s. It was only under Pinochet's military government of 1973-89 that it became private. Izquierdo, Lehmann and Searle's design, was chosen in a private competition of five entries in 1993, by a jury of DUOC staff and an external architect. Competitions of this kind, outside the College of Architects, are quite common in Chile.

The design aims to continue the same spirit of the tradition established in the thirties: a strong architecture that supports the real sense of the institution – in this case a High School to train young people between the ages of 18 and 24, in skills such as: graphic design, dress design, publicity, audiovisual communications, public relations, computer operations and management, as alternative to the humanistic and scientific approach that schools were historically designed to accommodate.

The site presented two peculiarities that the architects used as a basis for the master plan and to determine the position and level of the main buildings. Firstly, an existing thirties, German-style house in the centre of the flat sector of the site, and secondly, a small ravine with a copse of ancient trees that leads to the area where the house and some other leafy trees are located.

The main volumes are arranged in an L-shape in such a way that the now restored house takes on a new role. It articulates the open space by dividing the entrance civic courtyard and the rear, main activities courtyard.

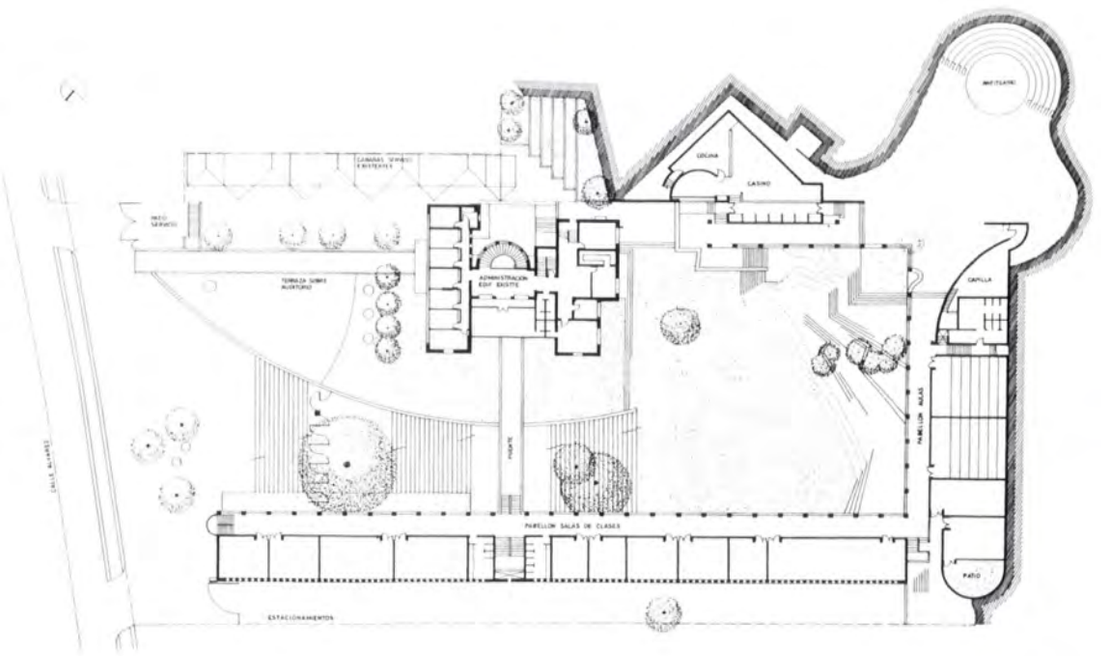
The project was separated into four independent but related buildings: the house, the small auditorium and two classroom buildings. The interior of the house was redesigned to accommodate the administration offices, reception hall, library and computer room.

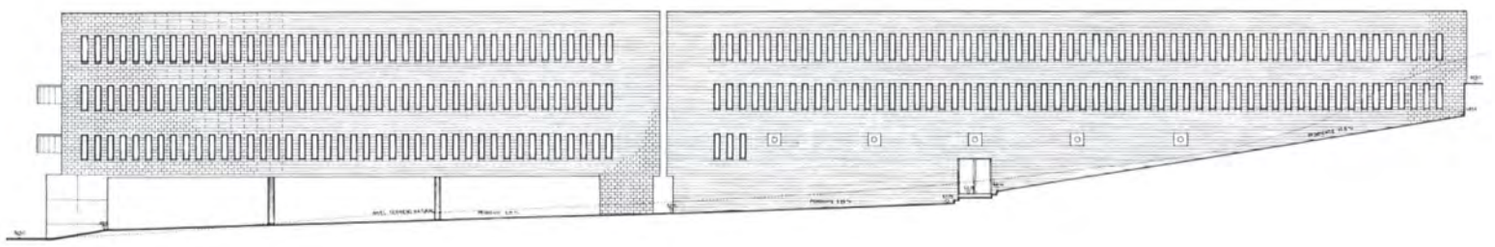


Opposite page *Interior of building showing strong minimalist sympathies and flexible spaces.* ***Above top*** *Entrance between carefully preserved trees and the strong curved wall of the outside of the auditorium.* ***Bottom*** *The concrete colonnade continues the strong geometrical grid of the facade of the building to the right of the entrance. Again the architects have kept existing trees to soften the formal built environment and to create dappled light*

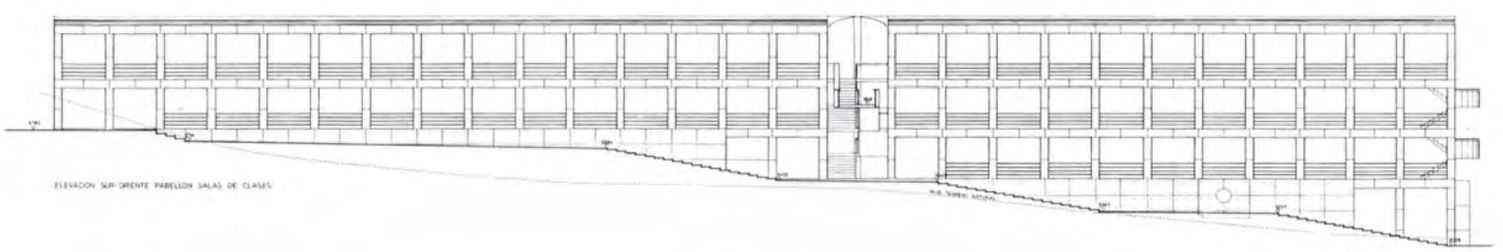
Izquierdo, Lehmann y Searle is a young partnership that already have a number of well designed houses, apartment buildings and office buildings to their names. Their work represents a landmark after the postmodern crisis of the 1980s that had such a profound influence over Chilean architecture in the last decade. The Fundacion DUOC building demonstrates a return to modernist principles focusing on the relationship between function, form and the honest expression of materials. Humberto Eliash, Chile's foremost architectural critic, reports. Photographs: Guy Wenborne.

Right *Site plan showing the connecting courtyards and the carefully designed outside space.* ***Below from top*** *North elevation of the classroom block which reduces in size towards the highest part of the site; south-east elevation of classroom building showing geometric facade; north elevation of classroom; north-east elevation of the "aulas" building; street elevation of the auditorium showing roof terrace on the roof and classroom block behind; north elevation of the auditorium and the existing thirties German-style house*



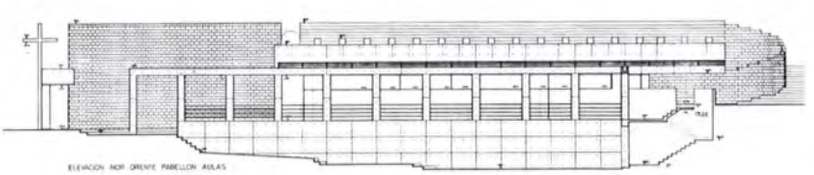


ELEVACION NOR-PONIENTE PABELLON SALAS DE CLASES

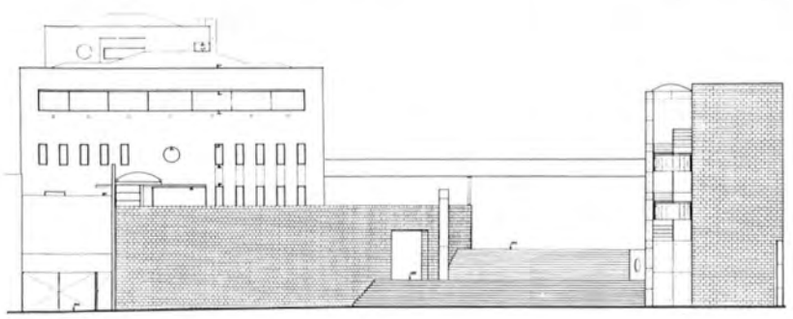


ELEVACION SUR-ORIENTE PABELLON SALAS DE CLASES

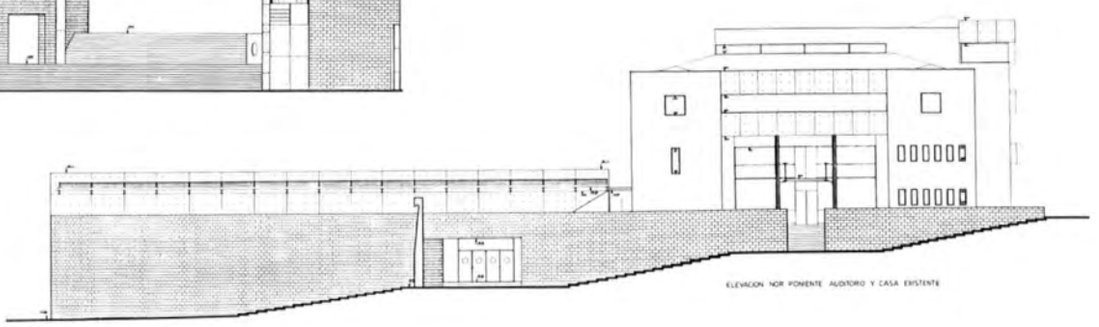
ELEVACION NOR-PONIENTE CASINO



ELEVACION NOR ORIENTE PABELLON AULAS



ELEVACION CALLE ALVAREZ AUDITORIO Y PAB. SALAS DE CLASES



ELEVACION NOR PONIENTE AUDITORIO Y CASA EXISTENTE

__Left__ The street end of the four-storey classroom block. Circulation space can be outside the main body of the building due to the pleasant climate of this seaside resort town of Viña del Mar. __Below top__ The "main activities courtyard" designated as a space for student meetings. __Below bottom__ The triangular volume between the existing house and the classroom block contains the cafe, showing how the interior space echoes the geometry of the project as a whole

The basement level was uncovered to lower the main entrance by a level. A third level bridge connects the house to the classroom block.

The other two main buildings are for the class rooms and workshops which face the courtyard. The light coloured concrete building is situated on a slope perpendicular to the street. It has four storeys at the front and one at the back but the roof is level. The other building of grey concrete is placed on the top of the site, serving as a boundary of the courtyard. This courtyard – a green space surrounded by a colonnade – is at the centre of the school. Viña del Mar's pleasant sea side climate means that this area often serves as a place for open air meetings. The artificial order of the architecture is articulated by the natural order of the ravine.

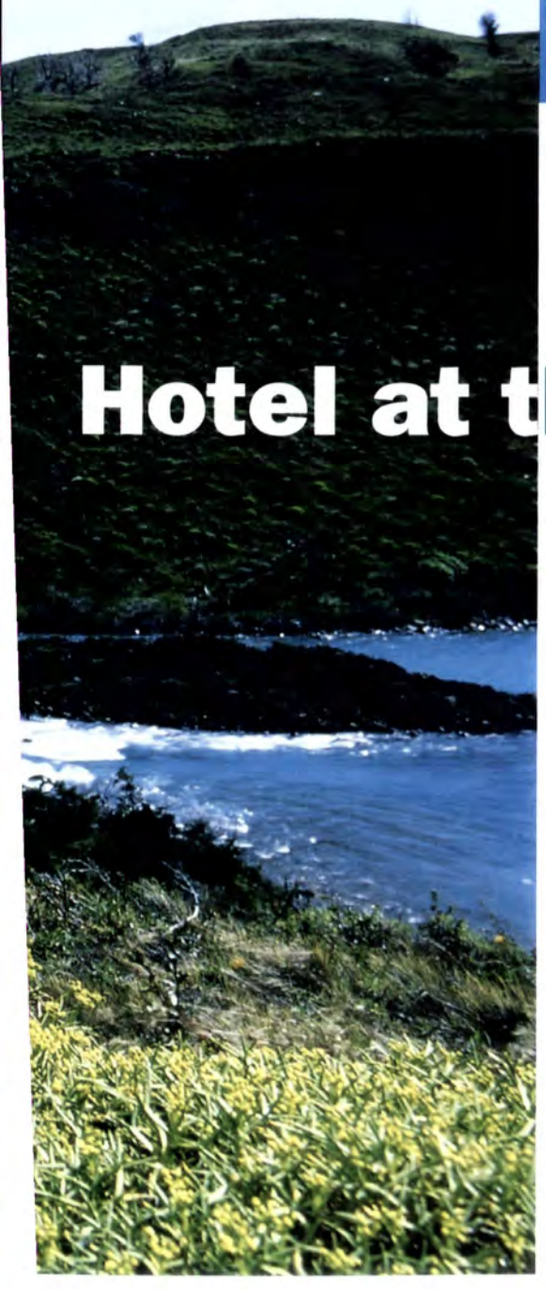
The design is comprised of strong gestures: the cafe is contained within a small triangular shaped volume between the house and the class rooms. The auditorium is located within a curved building whose spatial role is to provide a basement to the existing house, to define the main entrance stairway while keeping the existing palm trees.

The perimeter walls define the main structure of each block in order to allow maximum freedom to make classrooms of varying sizes. The strong walls and the simplicity of the structural scheme reminds us that the school is located in a country that is often subject to tremors and earthquakes. The balance of smooth concrete and rough brick finish used in the Fundacion DUOC project follows the pattern set by other designs by Izquierdo, Lehman y Searle. This use of materials reflects a sympathy for the modern principles of materials ethics, using a strain of formal minimalism to achieve an atmosphere of austerity and simplicity.

The Fundacion DUOC building is a remarkable work that communicates sensitivity to place without compromising the rigour of the structure and honesty to materials – harmonising the landscape with, what we call in Chile, the "manscape". **WA**

Project	Sede de Educacion Tecnico - Universitaria Fundacion DUOC
Client	Fundacion DUOC
Architects	Antonia Lehmann Luis Izquierdo Rodrigo Searle
Structural Engineer	Luis Soler
Construction Engineer	Nahmias Hmos. Ltda
Electrical Engineer	Concha y Gana Ltda
Environmental consultant	Joaquin Reyes
Acoustics/Lighting	Oriana Ponzini

Below *Looking south towards the* ***Salto Chico Hotel*** *begun in 1992. Explora, the client, is committed to protecting the environment: the generators are in sound proof sheds to prevent noise pollution although solar power is used whenever possible; there are no gardens just wooden walkways into the Patagonian pampas; the plumbing network is isolated from the lake's water systems and the building is heated using conventional radient heat systems and wood fires which burn dead wood purchased outside the park.*
Opposite page *View north to* ***Casa de Baños del Ona*** *finished earlier this year. In this spectacular park with the turquoise-blue, glacial Lake Pehoe and the dramatic granite tipped Cuernos that mark the end of the Andean chain, the hotel's Casa de Baños was designed as an understatement "the second moment – the part of the beach you see when the tide retires" (Germán del Sol)*



Hotel at the end of the world

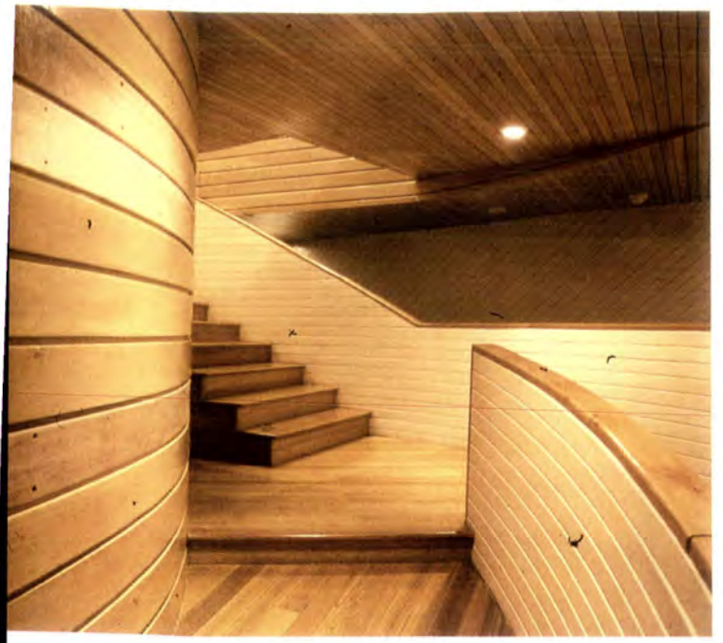
Chile's most successful hotel architect, Germán del Sol talks about the Salto Chico hotel in southern Patagonia and, for the first time, allows *World Architecture* a sneak preview of his plans for a second Explora hotel in the Atacama desert in the north, due to be completed in 1997.

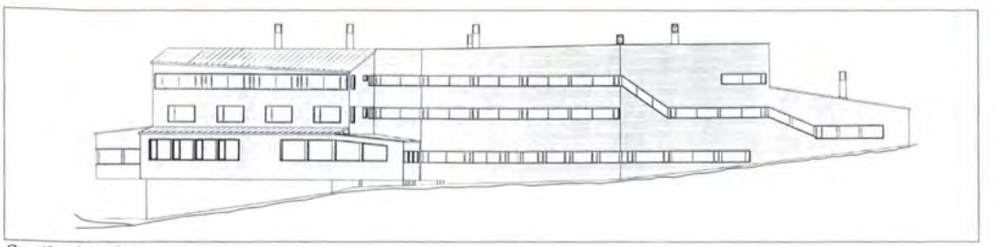
Text: Katherine MacInnes. Photographs: Guy Wenborne.

It is impossible to get to the south of Chile by road. The remote glacial landscape of Patagonia can only be reached by boat from Puerto Mont or by road through Argentina. The Salto Chico Hotel built by German del Sol and José Cruz, architects of the Chilean pavilion at the Seville Expo, is located in this inaccessible region in the Torres del Paine, one of the most stunning National Parks in the world.

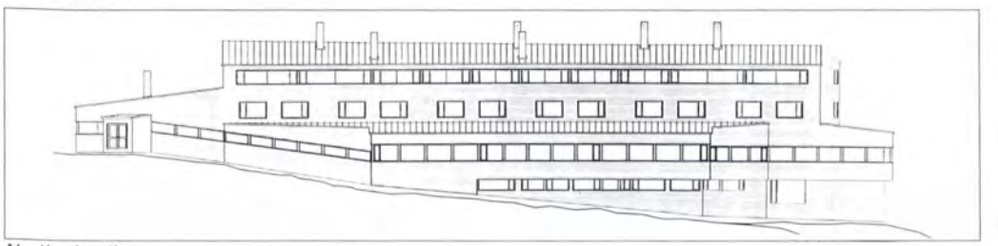
Lacking both the mineral wealth of the desert north, and the fertile agricultural land around the capital in the middle, southern Chile has had to capitalise on its natural beauty. The client for the Salto Chico, Explora, is a private Chilean hotel company with an alternative "poetic" view of travel. Due to the extraordinary success of their Patagonian project, Explora has commissioned del Sol (del Sol and Cruz now run separate practices) to design more hotels in other areas of natural beauty: the island of Chiloe and the Atacama desert.

The fundamental idea behind these hotels is that they offer an escape; a place where visitors can become re-acquainted with nature far removed from their busy lives. The Salto Chico is on the shores of the turquoise glacial Lake Pehoe cradled in a bowl of the Andes which creates a relatively mild microclimate. The horizontal design of the hotel stands in contrast to the the dramatic granite-topped "Cuernos" surrounding it because, as del Sol explained, "the relationship between places and architecture is not based on a simple imitation of form but strives to capture the unique essence of each environment."



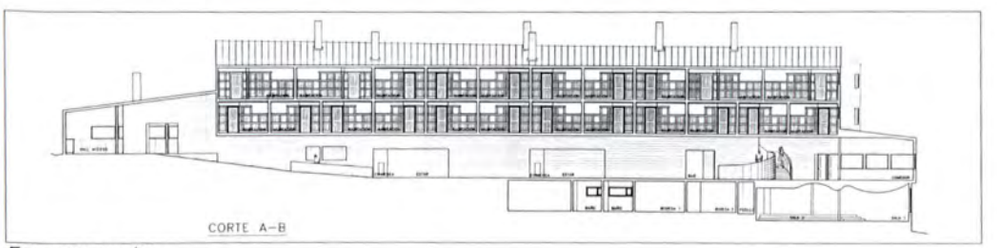


South elevation

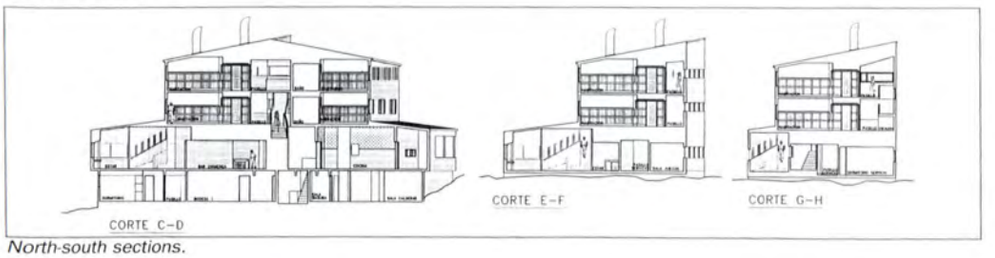


North elevation

West elevation (left). East elevation (right)



East-west section



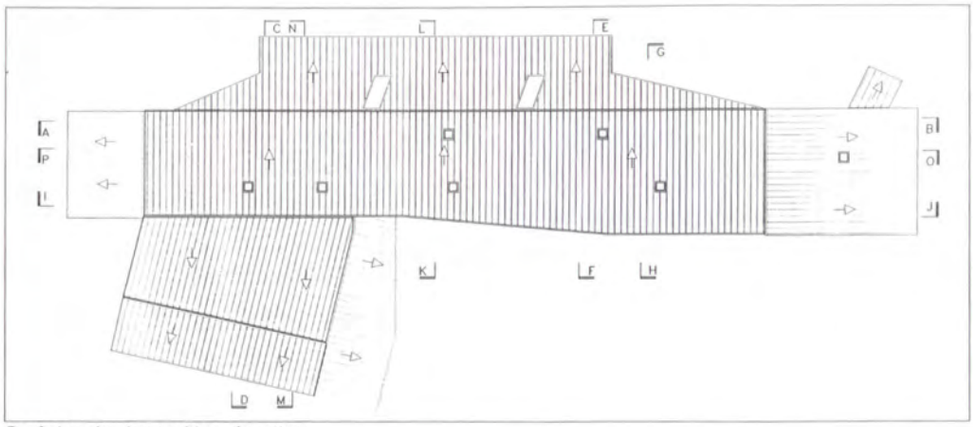
North-south sections.

Above left *The staircase is the pivot around which the continuous circulation space on the first floor swirls. It forms a feature for the inside wall of the dining area and the back of the main bar.* ***Above right*** *The main reception area with a ramp down towards the dining room. On the left is the hall with tree trunks in their natural state. Del Sol regrets this "folkloric" gesture in retrospect, since, although it refers to the orignal Patagonian dwellings, since he is of European descent, the gesture is empty. He believes that while the hotel should use local resources, they should be tamed and civilized inside the hotel to contrast with the raw nature outside*

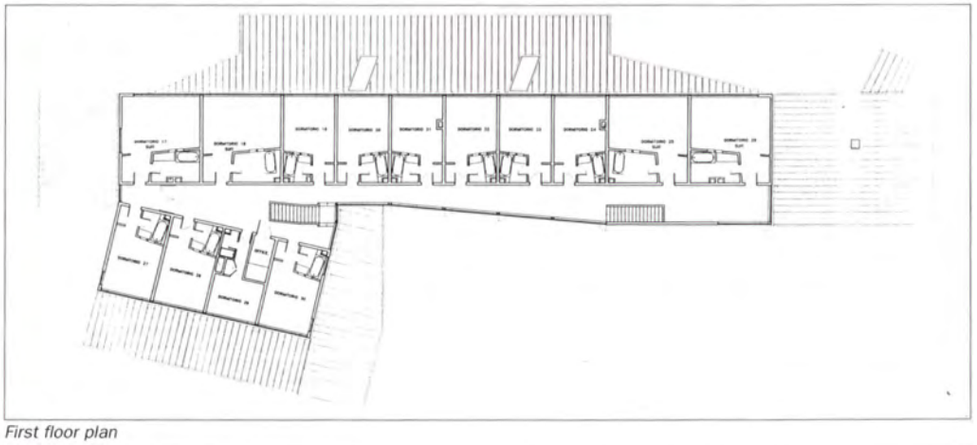
While guests are offered a variety of trips into the park, this hotel was conceived as the "eye of the storm". Del Sol describes it as "a refuge, an intermediate stage. That is why the doors are very small. You are either inside or outside." The interior captures the "essence" of the environment in that it is about "endless space" conceived as a complement to the limited contained nature of city life. The continuous circulation space around the perimeter of the ground floor, pauses occasionally in eddies with seating and dining spaces on different levels, accessed by ramps. Windows running the extent of the white washed louvred exterior, mean that the interior is intelligible from outside. In the centre there is a protected inner space with a bar and a sculptural wooden staircase giving access to the bedrooms on the first floor.

Like all Explora hotels, the Salto Chico was built using local labour, materials and sources. Attention to detail in the interior, designed in consultation with Ana Paz Turell, is particularly evident. The furniture, for example, was specially designed for the hotel using seven different native woods including "Cipres de Guaitecas" a scented wood, with which craftsmen from Aisen on the Río Baker pannelled the bathrooms. Cow hide chairs manufactured by Muebles Sur were designed by the architect

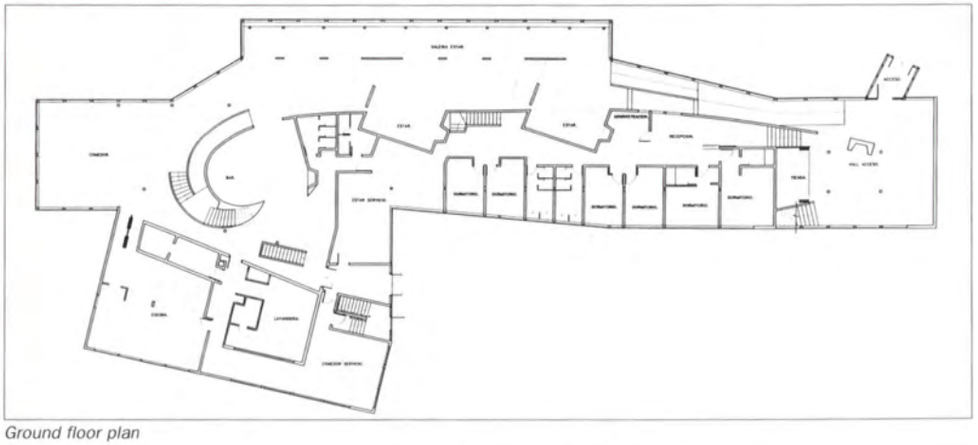
Below from the top *Bathroom with view north towards the Cuernos; one of the bedrooms with furniture designed by the architects; seating areas in recesses of the hotel's ground floor open plan with views of the lake to the right of the picture*



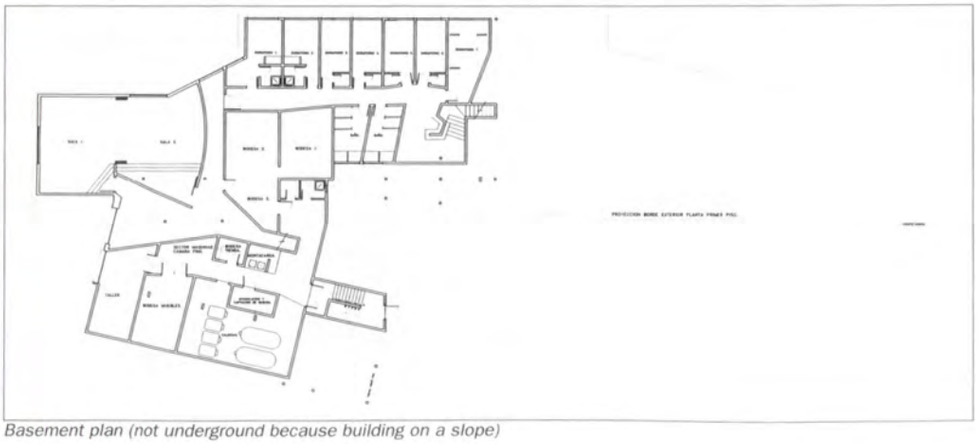
Roof plan showing position of sections



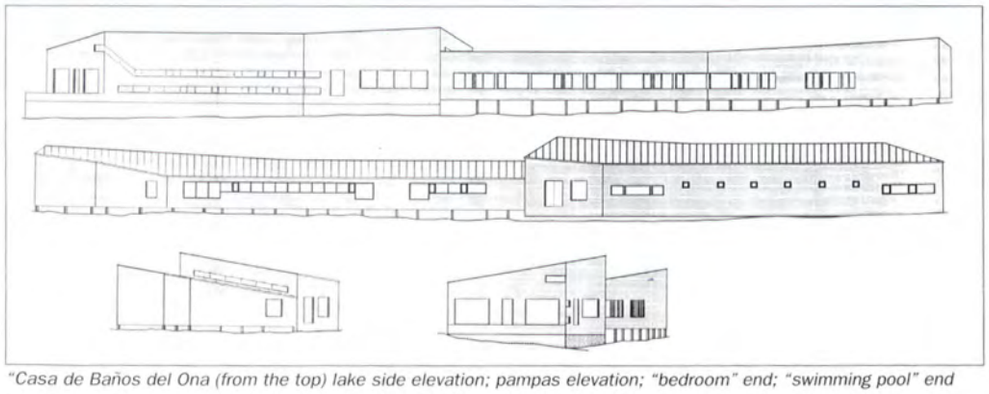
First floor plan



Ground floor plan

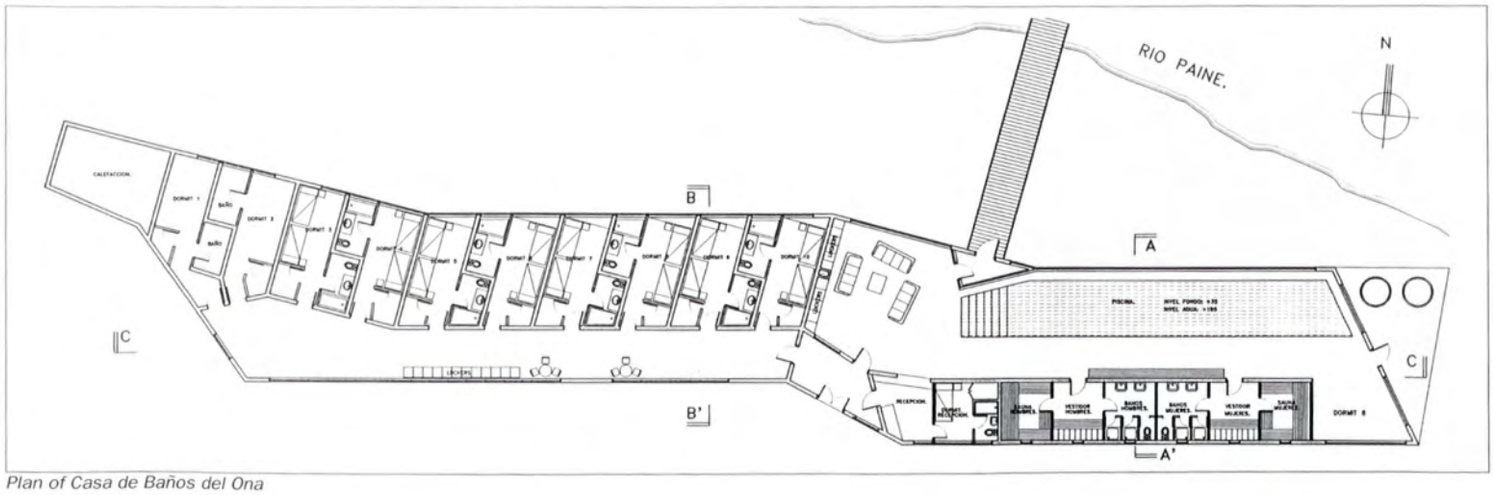


Basement plan (not underground because building on a slope)



"Casa de Baños del Ona (from the top) lake side elevation; pampas elevation; "bedroom" end; "swimming pool" end

Colour photos. ***Left*** *Casa de Baños appears as three separate dwellings from the lake, as a mark of respect for the traditional "cluster" formation of other building groups in this area of Patagonia.* ***Right top*** *A view into the swimming pool area with the two outdoor heated jacuzzis sunken into the wooden terrace overlooking the lake.* ***Bottom*** *Swimming pool with local slate floor*



Plan of Casa de Baños del Ona

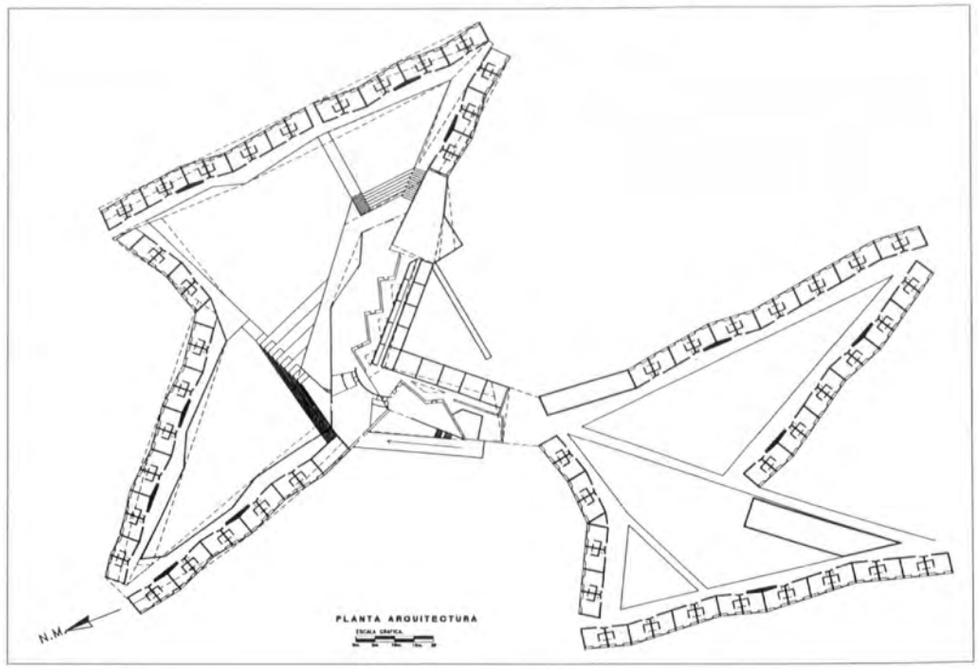
Germán Rodriguez Arias for Pablo Neruda (the famous Chilean poet's) home. The roof is copper, a metal responsible for almost 75 percent of Chile's export trade, and the floors are slate. Fittings were imported from America and Italy to achieve the quality international visitors expect.

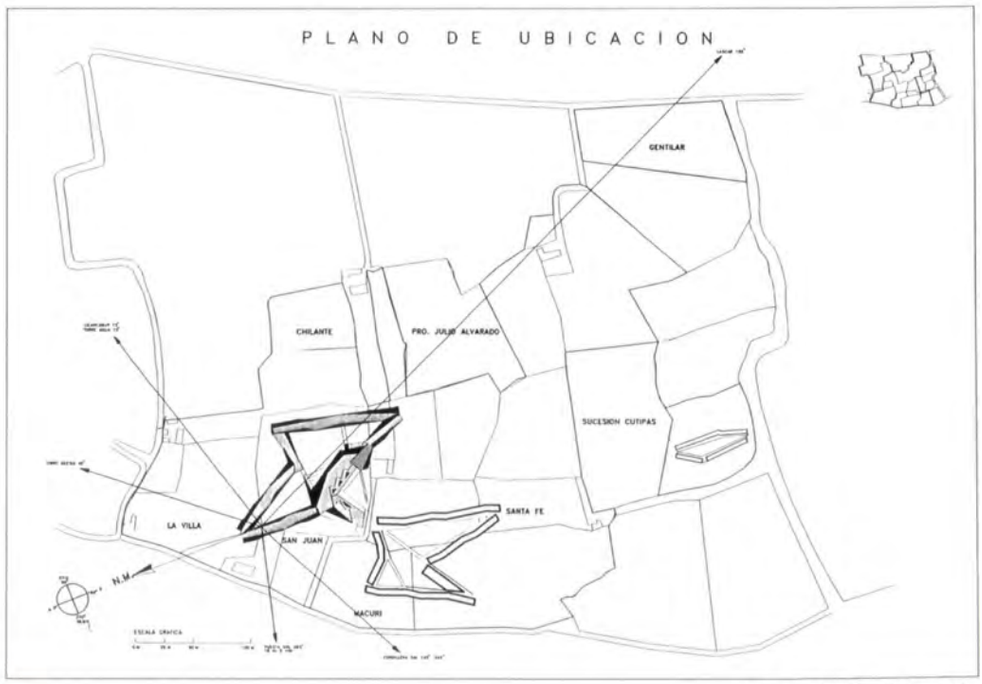
With the recent completion of the Casa de Baños, the final stage of the Salto Chico, Germán del Sol can focus on his next project in San Pedro de Atacama. Due to the high profile of his Patagonian project, architects and students in Chile are waiting with bated breath. I asked him how he plans to approach this project in the hot, flat desert of the north: "The Atacama does not have a powerful 'reality' in the same way as the Paine. So the first task is to give presence to the things you can't see: the dispersed plots of land defined by a mud wall boundary; the uniform positioning of houses (back to the wind and facing the volcanoes where their gods live) and the legacy of the Pre-Colombian occupants." Del Sol's solution has been a dispersed development of linear groups of 10 to 15 apartments around an angular plot of land to retain a sense of the place. "We have created open spaces to alternate with closed spaces, to allow for the huge heat changes between night and day. But desert is about a sense of space. You will be able to walk over the walls, over the limits to get a longer view."

The Atacama project is due to be completed in 1997 when del Sol begins work on the third Explora project on the green, temperate island of Chiloe – likened by the famous Victorian explorer, Charles Darwin, to the south coast of England. I asked him if he had any ideas about this: "No, buildings don't express ideas. If they are good they can host the spectrum of human needs. Architecture needs to have a deepness that will detain you for a while. The Chilean Pavilion was a quiet place in an otherwise frantic Expo. That requires a deepness. And that is the sort of feeling that I am looking for in the next project which will be built on Chiloe." **WA**

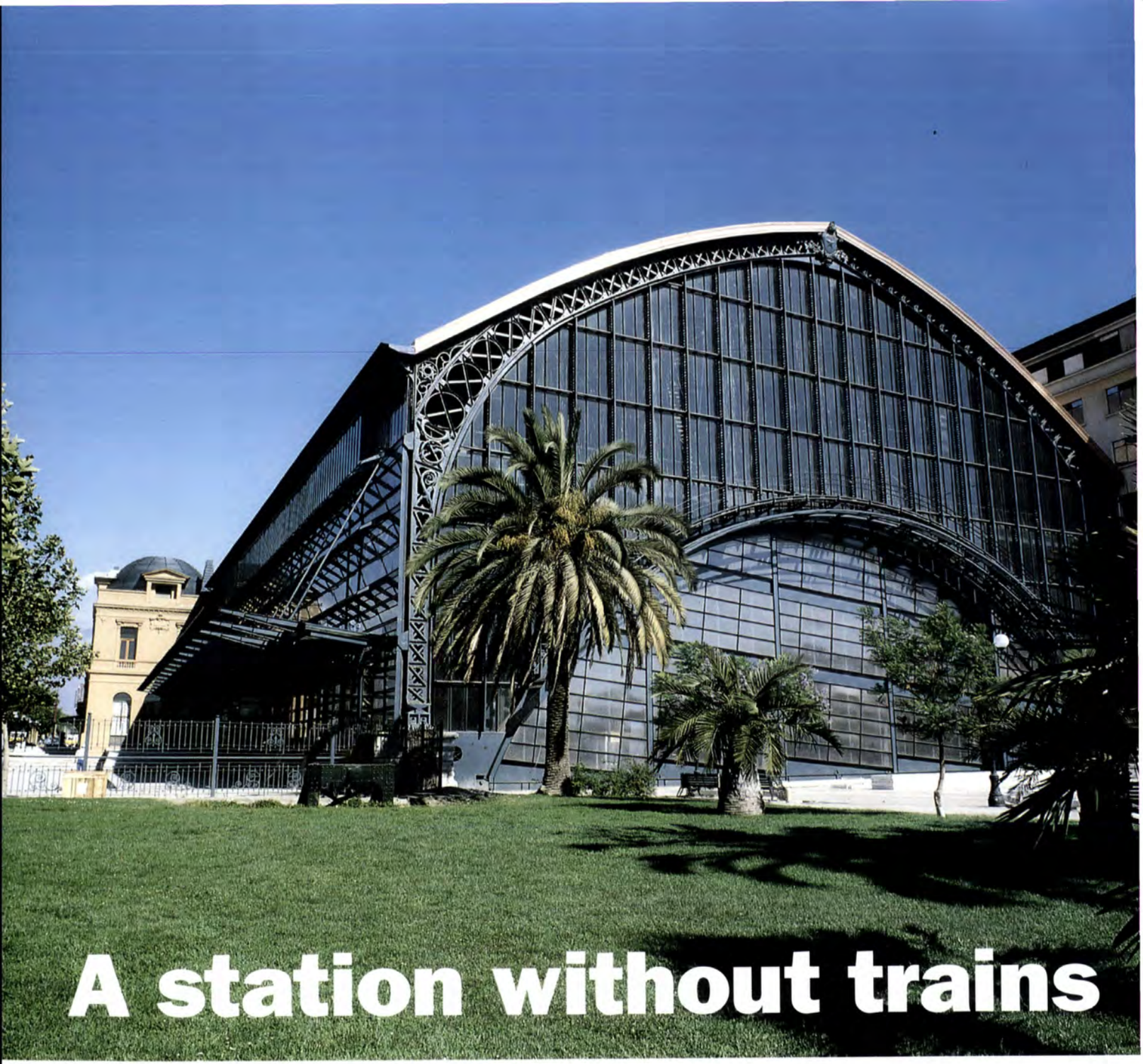
Project	Explora Hotel Salto Chico and Casa de Baños
Location	Torres del Paine (XII Region)
Architect	Germán del Sol José Cruz
Client	Explora
Building constructor	AALFA Construction Company
Interior design	Ana Paz Turell

Plan for the next Explora Hotel in San Pedro de Atacama





Site plan for San Pedro hotel



A station without trains

How much change can a building sustain before it loses its identity? Here is a station, built in Belgium, shipped to Latin America, erected in Chile, and now disused, which has acquired the status of a national monument. As a testament to the legacy of "borrowed" western culture in Latin America, it might seem a strange choice for a national cultural centre aimed at restoring confidence in the State; but it is, in fact, an honest expression of respect for old buildings that is not found in the north of the continent. Architects Monserrat Palmer, Ramón López, Rodrigo Pérez de Arce and Teodoro Fernandez won a competition to give the Mapocho station a new identity and have risen to the challenge of transforming a foreign, function-less building into a popular space for the arts.

Text: Katherine MacInnes.

The largest covered public space in Chile is not, as you might expect from a Catholic country, a cathedral – it is a train station. Due to the vast distances travelled, trains have featured large in the history of South America: the highest railway in the world was built out of British rolling stock between Arica on the coast of northern Chile to La Paz on the Bolivian plateau. Trains were used to transport copper and nitrate from the mines in the Atacama desert and to carry coal in the south. But some trains were used to transport people – to take work weary Santiagueans for a rest at Valpariso and Viña del Mar on the west coast. The Mapocho station, located to the west of Santiago, was one such station. The Beaux Arts style in which it was built says more about the "leisured classes" that congre-

Opposite page *The track area at the back of the station has been transformed into a new city park. The main arched frame dates from the early 1900s. In contrast to its regular geometry, the angle of the horizontal cross bars of the semi-circular door provides a modern dynamic, and, for the first time, relates this imported building to its site by echoing the gradient of the land on which Santiago was built.*

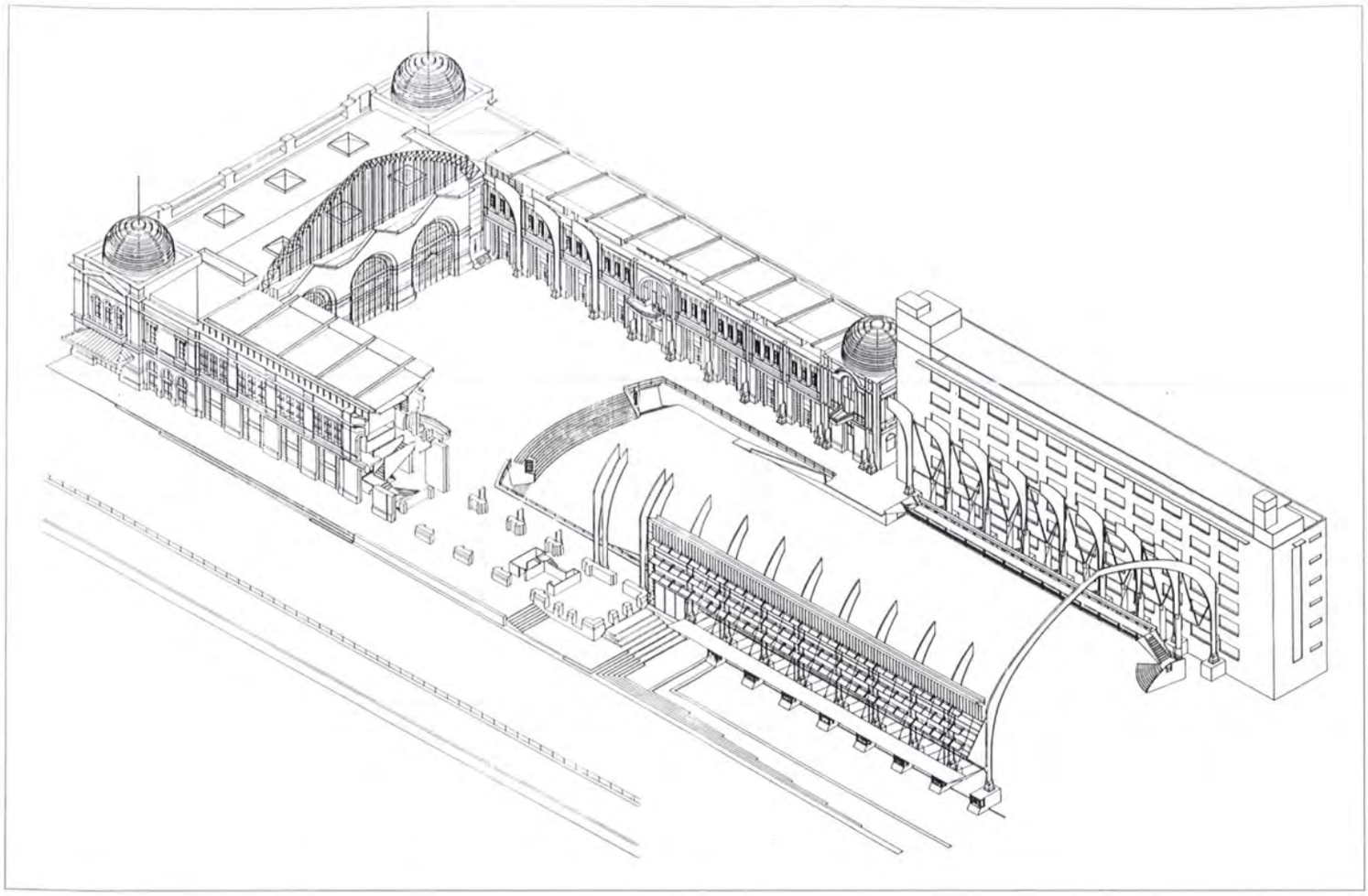
Clockwise from top left *The glass river facade with louvred wall to control heating; the original station entrance with glass portico showing new bronze cupolas; interior space showing split passenger/train levels now used to define the auditorium and stage with entrance to the first floor offices in the far corner and commercial space under the arches; an exhibition being installed in the main vault showing the open door which links inside with the park outside for large events; "temporary" phone boxes next to the door. (All photos on this spread by Javier Cathalifaud)*

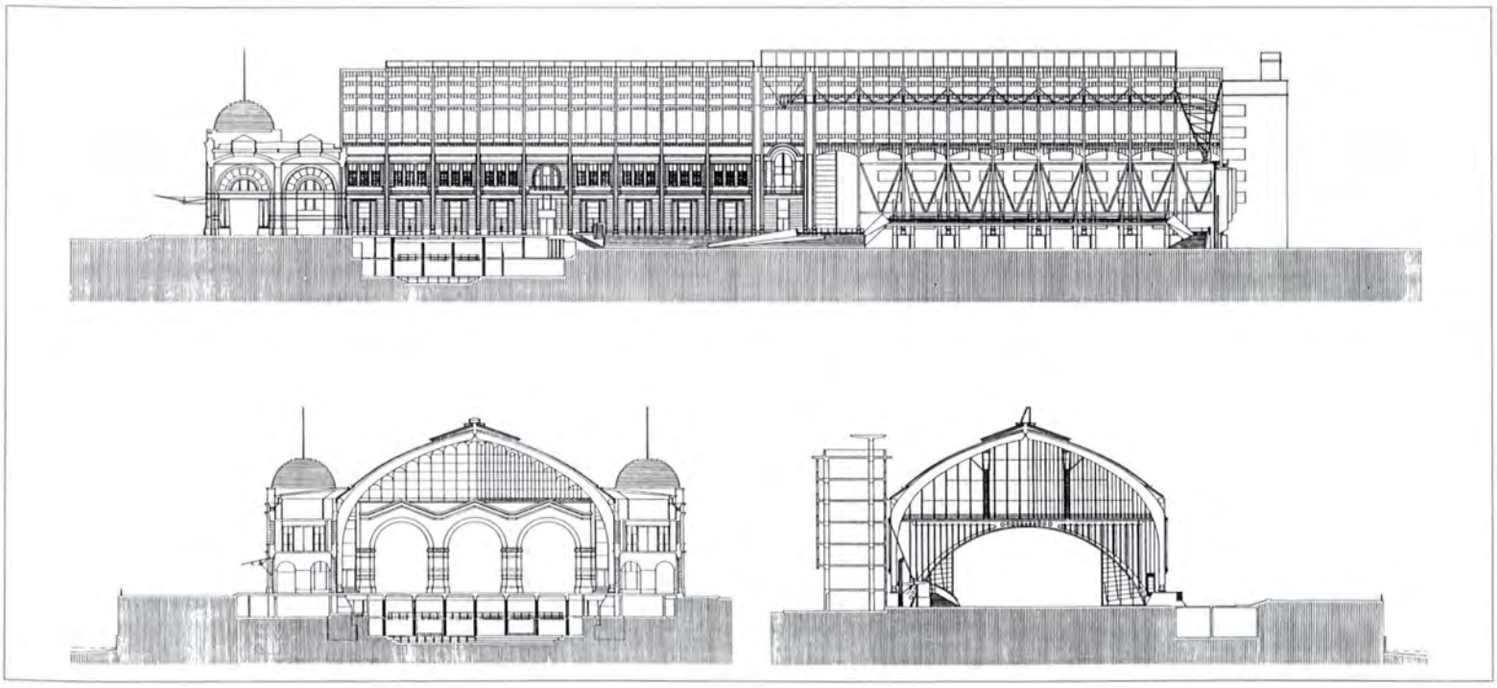
gated here of a weekend than the mineral wealth which funded its construction. The Mapocho station was built by the architect of the Museo de Bellas Artes, Emilio Jequier, between 1910-1913 to celebrate the centenial anniversary of Independence from Spanish rule. The irony of this "independence" is that, as in the north of Chile where there are churches by the French engineer, Eiffel, the pre-fab structural frame of the Mapocho station was shipped from Belgium. Turn of the century Chileans believed that imported "European" culture was more important that the context in which a building sat. However the Andes, which dominate this narrow country, mark the edge of a tectonic plate and the Belgian-made frame was not stressed for earthquakes. It was only when the station was chosen as the location for the cultural centre by the first government after Pinochet's miliary junta in 1989, that the full implication of the restoration came to light.

The new government sought to re-emphasise the need for public rather than private spending. The Mapocho station is located in the western suburbs of Santiago in a strip of parkland that runs into the poor area of town. In order to renew confidence in the State and to restore a national monument the mayor, Jaime Revinet, led a campaign to create a cultural centre for the people. By re-contacting exiled Chilean architects such as Borja Huidobro in Paris, he organised case studies of European cultural centres such as La Villette and the Museé D'Orsay and the lessons learned were applied to the new Mapocho Centre.

Architects Palmer, Lopez, Perez de Arce and Fernandez were chosen because their design proposed to animate the vast 15, 000 square metre space without dividing it. They rose to the challenge of using the height to empower the space rather than to intimidate, to open it to its urban landscape and to make minimal adaptations to adjust the building to its new role.

After securing the structure they introduced a luminosity by replacing opaque roofing panels with glass along the edges and the spine of the roof. The entrance hall and sides of the station were made into three storey spaces available for rent. The facades of these new sections are glass and metal to blend with the main structure. Two stairways sunk into the sides of

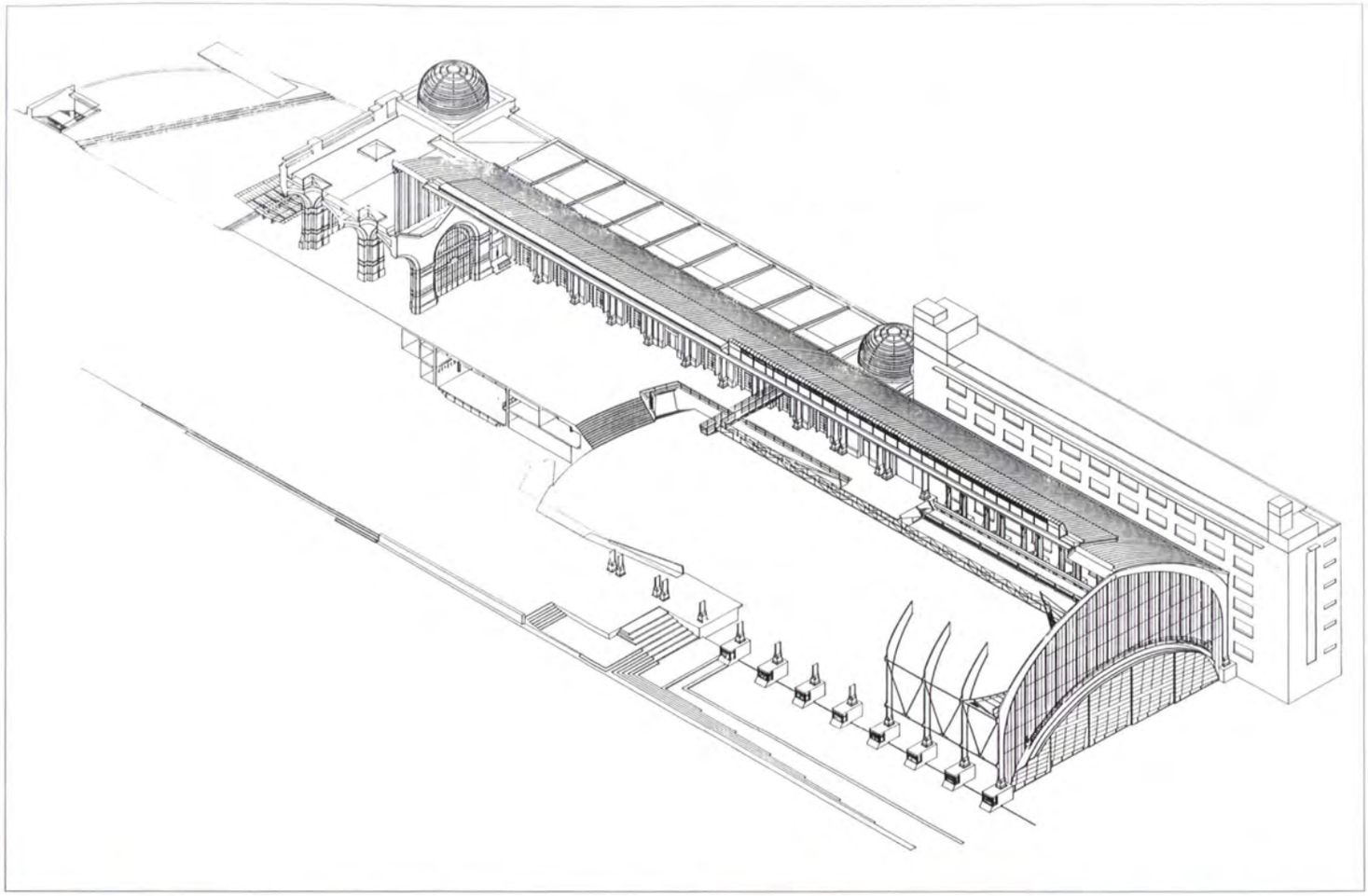




the entrance hall allows views of the original vast supporting brackets along each side giving the impression of a receeding avenue of trees. These stairways lead off the main space to access the offices on the first and second floors. On the first floor, the restaurants and book shops spill out onto the floor of the main space to encourage "street-life".

The main knave is split into two levels: under the entrance hall there is an enclosed auditorium, which seats 1000, where the acoustics and lighting are independent of the main space. In its new role the building requires sophisticated technical support for shows, exhibitions and concerts. Plant equipment is located discretely in the structural pillars. The main space is flexible and depending on the scale of the event split levels provide a stage or an auditorium.

Where the trains exited, there is a semicircular door the shape of which provides a dynamic contrast with the Beaux Art arches of the beginning of the century. The angle of the door's cross bars reflects the slope of the site. The door can be opened in the summer to link the building with the "Parc de les Reyes" and the adjacent Mapocho river. By replacing the masonary wall of the riverside facade with glass, the architects have taken full advantage of this natural feature and increased the amount of light that enters the building but also the amount of heat which



Bo Lind Knudson

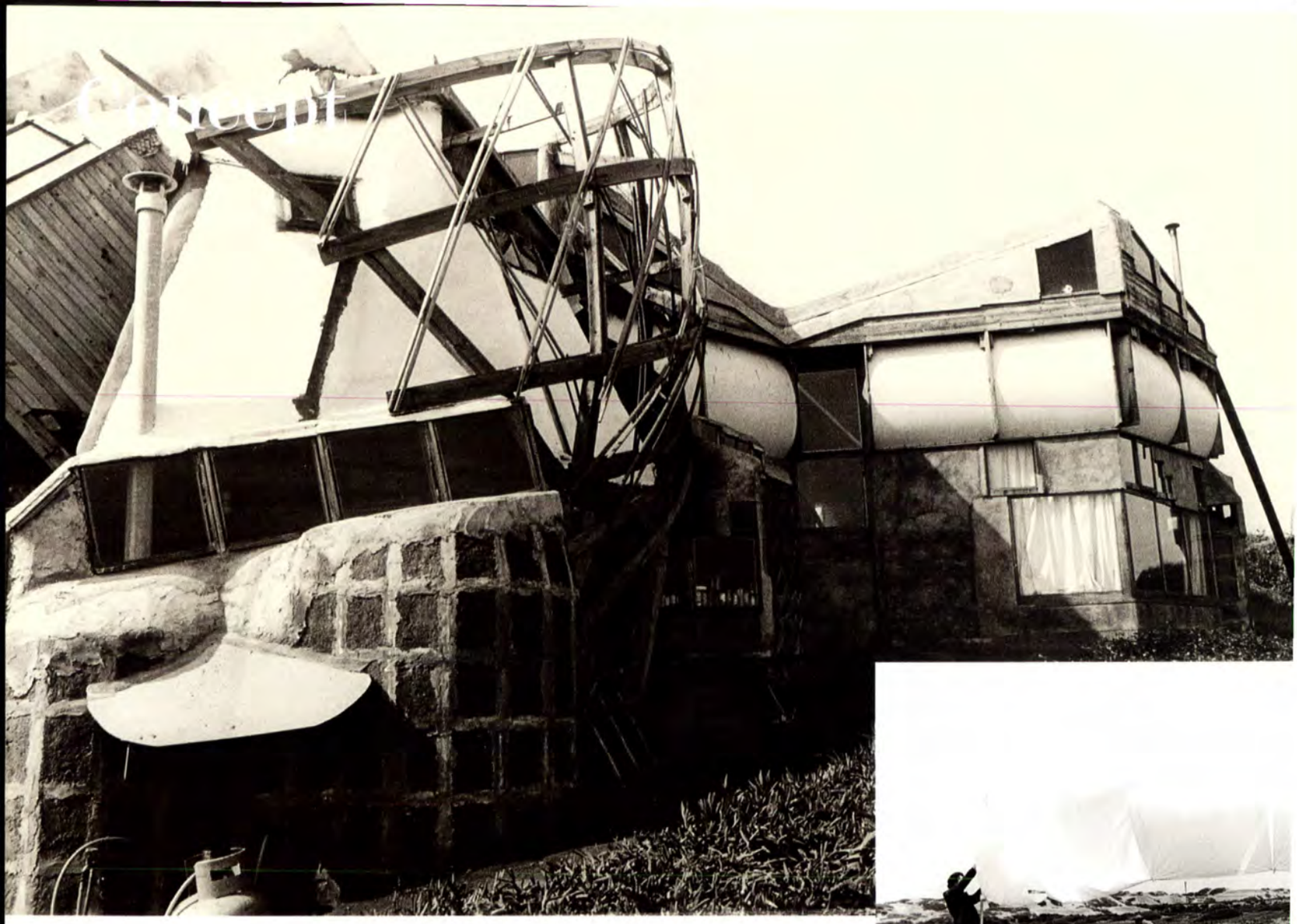
Bo Lind Knudson

Opposite page top *A cut-away axonemetric showing the reomoved wall of the river facade to increase the amount of natural light.* ***Opposite page bottom*** *Side elevation showing the basement, now used as a second auditorium with separate light and sound. Two elevations of the street (left) and park (right).* ***Above*** *Axonametric showing the relationship between the entrance and the train shed. Stairs either side of the main staricase lead to the underground auditorium.* ***Left*** *The Bienalle exhibition uses strips of plastic to break up the main space.* ***Right*** *Inverted paper cones hang from the ceiling in the passenger entrance for as part of an interactive installation in the Bienalle*

necessitated a hi-tech louvre-ventilation design. Architect Perez de Arce regrets that, due to funding, many of the architect-designed features such as overhead bridges for lighting and acoustic devices, balconies for television crews or performers and a large projecting screen towards the west front are not yet in existence – but concludes philosophically by quoting Victor Hugo that perhaps "time is the architect".

From the outside, the new Mapocho station, which can be seen for miles, gives the impression of shiny newness with its glass facades and entrance canopy and copper cupolas. It makes full use of its proximity to the park, the river and the Mapocho metro station and is already popular with city dwellers, tourists and culture vultures as a stimulating and relaxing public space. As a landmark building and a cultural centre it bridges the gap between the elegance of the past and the ambitions of the future. **WA**

Project	Mapocho Station, Santiago
Client	Municipalidad de Santiago, Corporación Cultural Estación Mapocho
Architect	Monserrat Palmer, Ramón López, Rodrigo Pérez de Arce and Teodoro Fernandez
Architectural collaborators	Paulina Courard, Ricardo Cruz, Smilyan Radic, Cecilia Puga, Claudio Vásquez, Pablo Allard
Engineers	Jaime Collados, Omar Góngora, Jeanne D'Arce Saintard (arq)
Structural engineer	Santiago Arias
Technical inspector	EADE-IDEPE
Acoustic engineer	Leonardo Parma and Eugenio Collados



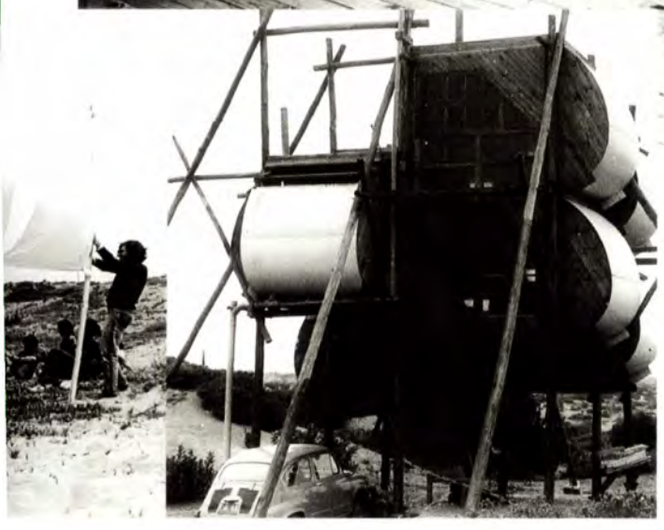
The wise man built his house upon the sand

In the early 1960s the Chilean architect Alberto Cruz and the Argentinan poet Godofredo Iommi bought a plot of land on the beach outside Valparaíso, Chile with the intention of building a city. Until recently their venture was dismissed as an impractical joke. Now architects consider the "Cuidad Abierta" or "Open City", to be leading the Renaissance of Latin American architecture. Katherine MacInnes went to Valparaíso to ask Alberto Cruz about this metaphorical and literal "turning of the tide".

"Well obviously we have learned to build on sand in an earthquake zone but that is not really the point" Cruz explained. "Godo and I set out to create a metaphor: a firm foundation for the identity of Latin America in the shifting sands of modern times."

The Open City is a "laboratory" for the Valparaíso School of Architecture whose motto is "The rhyming of words and actions" which they attempt to realise through "happenings" – spontaneous performances inspired by poetry. Their understanding of poetry has more to do with the original Greek sense of the word "Poiesis" (a privileged insight into humanity) than writing verses.

I was invited to a "happening" in one of the city's public buildings, a "Music Room", a windowless wooden cube built around a single pillar of natural light within hearing distance of the waves crashing on the beach. Afterwards Cruz told me that the "happening" I had witnessed, performed by the students and professers of the Valparaíso School of Architecture



Clockwise from opposite page left *Hospedería de la Entrada (1984) built on a planted sand dune; interior of the music room (1972) founded on the relationship between music and space, seen through the medium of light; zig-zag walk way to the "agora", an open air lecture space; garden of the poet Efraín T Bo (1980); Hospedería de la Alcoba (1976) with "billowing walls" on stilts; students experimenting with shapes created by wind. Photos by Bruno Barla and Manuel San Fuentes and the archives of the Valparaíso School of Architecture*

"shows that there is a difference between what each person thinks and what is thought in a collective way, but the common voice says the same thing for everyone. But the happening wasn't just a collection of information – it talked about three dimensions: the effect of the study and the occasion."

The effect was when, in 1952, Cruz refused to take up his position as professor of architecture at Valparaíso unless the university accepted his philosophy of "collectiveness" and allowed him to come as part of a group of artists, poets and professionals. The "study" involved various methods of acting out poetic realities. The "occasion" was the Cuidad Abierta.

The "study" began with an international group of poets who trekked from Patagonia to Bolivia in an effort to discover the real identity of Latin America (not one based on native tradition or subsequent colonial influence) from which to create truly Latin American architecture. They couldn't enter the "poetic capital" of Santa Cruz in Bolivia, because the legendary guerilla leader, Che Guevara, was there. The subsequent collection of poetry, "Amerida", reflects on both these simultaneous but contrasting ways to shape its destiny.

Referring to the "occasion" of the Open City, Cruz explained: "We live infront of the sea as a testimony to the relationship between the act of inhabitation that is the first act of architecture. All the rest is secondary". The billowing forms of the flags in some of the performances are realised in the bent metal sheets that form walls curved on both a vertical and a horizontal plane. The lines burnt in the sand to form triangles can be seen in a brick monument to the poet Efrain T Bo, built on the nearby hillside. But these buildings are not essentially valuable: "architecture has ideas and realisation" said Cruz. "We are concerned with ideas not realisation at the moment."

Ideas generated through the laboratory of the Open City have been more influential than any buildings. Cruz's visionary notion of "loose city planning" was controversial in the era of Brasilia but it is now widely accepted that conceptual rather than detailed planning is the way forward.

"The poem allows several realities to exist simultaneously" said Cruz. "For example 'hospitality' was the poetic concept on which we designed this city. 'Openness' developed from this." Similarly, forms such as those conceived by German del Sol (who admitted "Alberto Cruz has been the biggest influence on my work so far"), show that by rejecting historical forms of the native traditions, colonialism and later European modernism, Latin American architects can capture poetic realities of a place to produce a form that is original, specific and invigorating.

"Today architectural buildings are mostly synthetic" said Cruz. "We think that man must 'touch' the earth. We cannot leave the world untouched. To explore this relationship we bought this plot of land on sand. It is a relationship where man dominates nature but without destroying it. We are seeking a constructive relationship in the Cuidad Abierta." **WA**

Designing for a new world

Anshen + Allen's global view

Over the past 15 years Anshen + Allen has grown from a medium-size local San Francisco practice to an international leader in the field of healthcare, research and education architecture, and, increasingly, "pre-architecture". Colin Davies traces the firm's development and meets the quiet Englishman whose combination of altruism, pragmatism and refusal to stand still, has put the firm where it is today – ready for the twenty-first century.

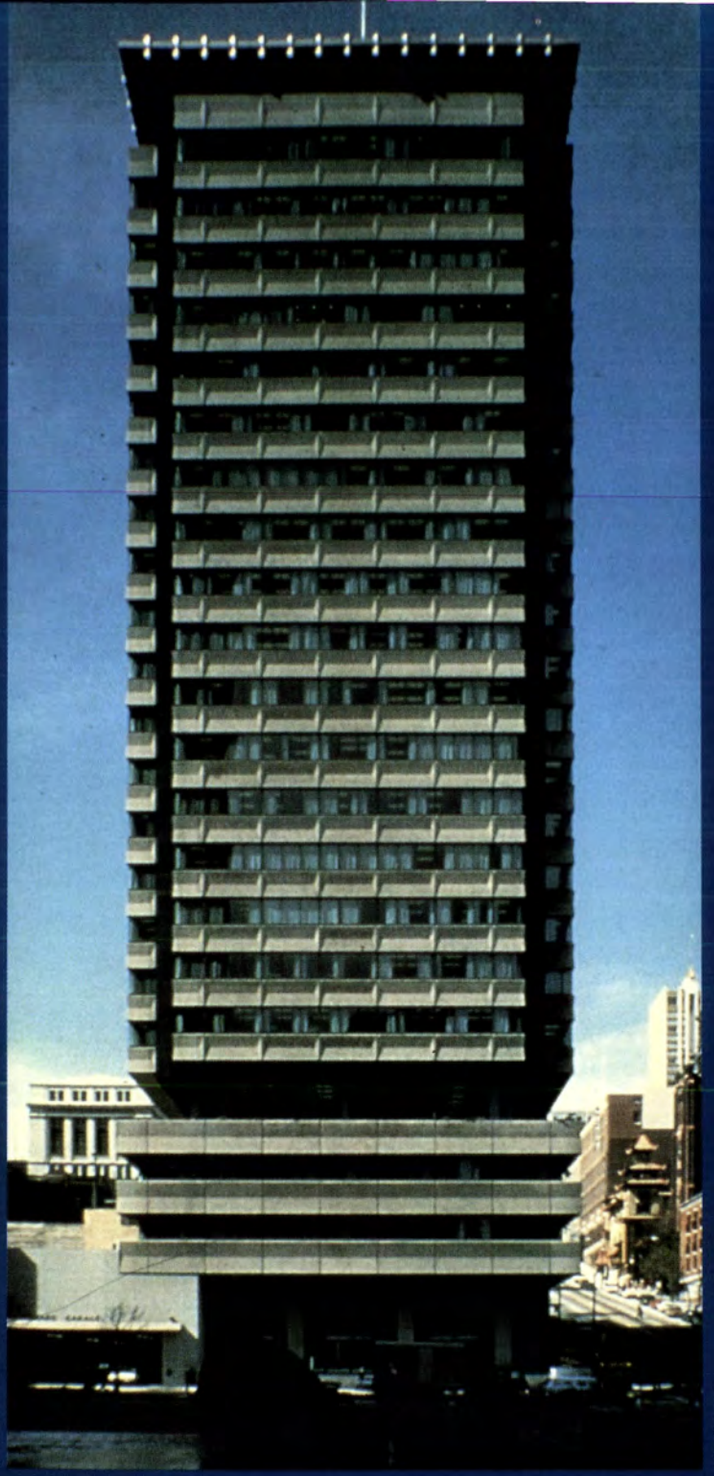
The partners in the San Francisco office of Anshen + Allen are assembled for a lunch-time meeting. Among them is a quietly spoken 62-year-old English architect. When he speaks, everyone listens. It isn't just that he happens to be the chief executive of the practice; the practice in its present form, with offices in Los Angeles, Baltimore and London, and more than US$2 billion worth of work currently in design and construction, is his creation. If this were a film, it would be an unlikely piece of casting, but Derek Parker seems comfortable enough in his role.

Parker first came to Anshen + Allen while working his way round the world in the early 1960s. He liked the Californian climate of freedom and enterprise and when Bob Anshen and Steve Allen invited him back in 1964 he didn't hesitate. In 1965 he became a partner and, after the death of Bob Anshen at the age of 50 later that year, began to have some influence on the future development of the practice. Parker speaks of the original partners with affection and respect. "To understand the firm, you have to understand Bob and Steve. They had a culture – a commitment to quality and a tradition of service to the community – and although we believe in change, the one thing we are not changing is the culture."

One of the crucial decisions that Parker made in the mid 1960s was that the practice should concentrate on the health- and research-related work. There were two main reasons for this decision, and they neatly sum up Parker's approach to architectural practice. The first was altruistic: a genuine conviction that architects had a contribution to make to the promotion of health in the community. The second was more pragmatic. Hospitals and research buildings are complex buildings and few architects are prepared to make the effort to learn the language and develop the

Timothy Hursley

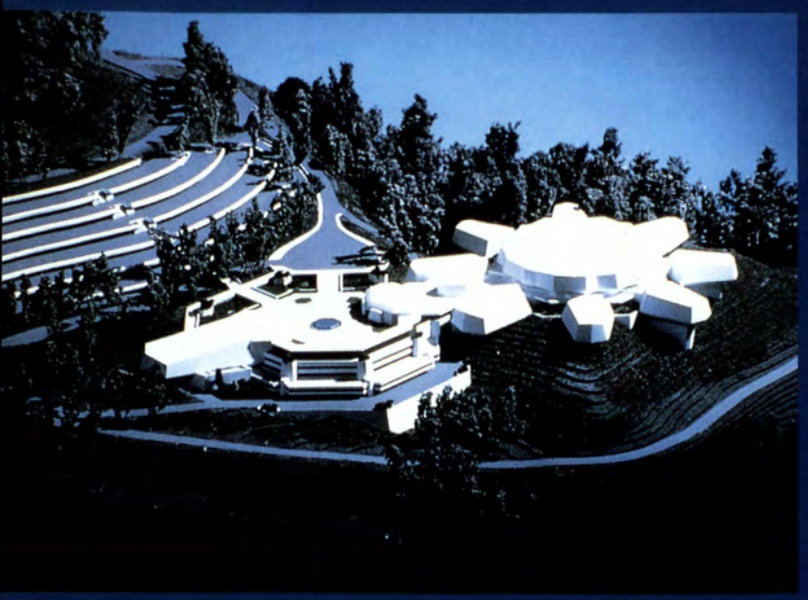
Anshen + Allen's addition to Louis Kahn's Salk Institute: an extremely accomplished exercise in Kahnian fair face concrete, glass and stainless steel

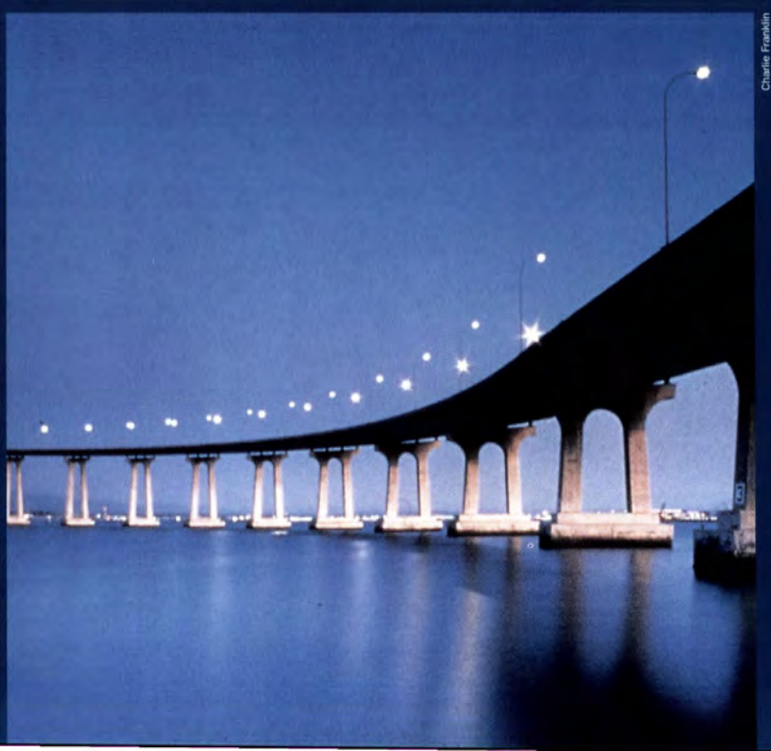


Julius Shulman

Marvin Wax

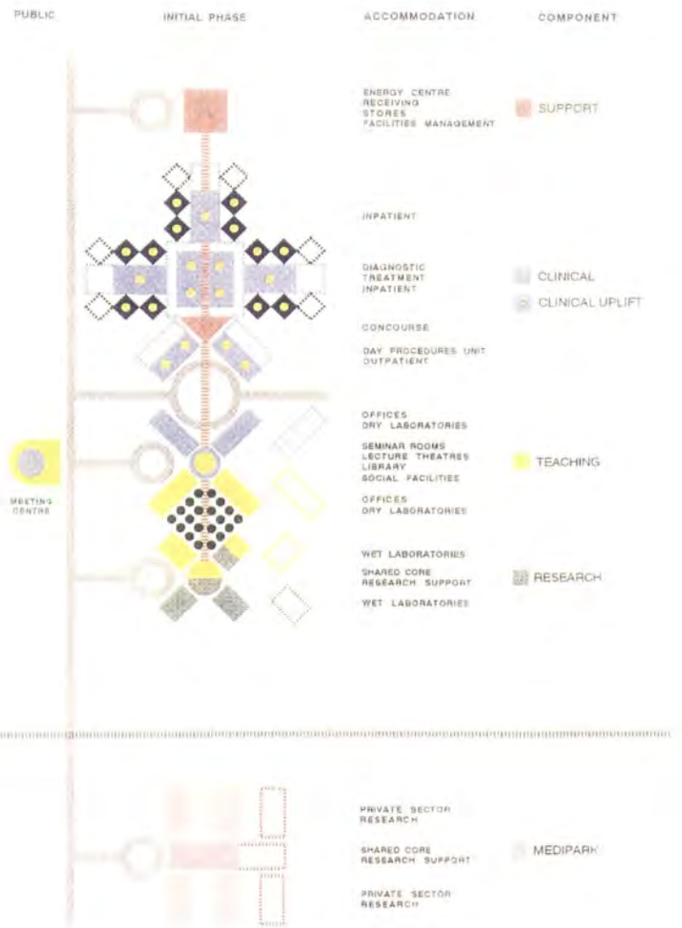
Julius Shulman





Charlie Franklin

"We don't often talk architecture with our clients. We talk to them about their problems in their language. They expect the architecture."



Opposite page *Significant early projects, clockwise from top left – International Building; Central Methodist Church; Eichler Homes; Chapel of the Holy Cross; Coronado Bridge; Lawrence Hall of Science.* ***Right*** *Component diagram of the University of Edinburgh Medical School where Anshen + Allen are helping the client to analyse their needs for the twenty-first century*

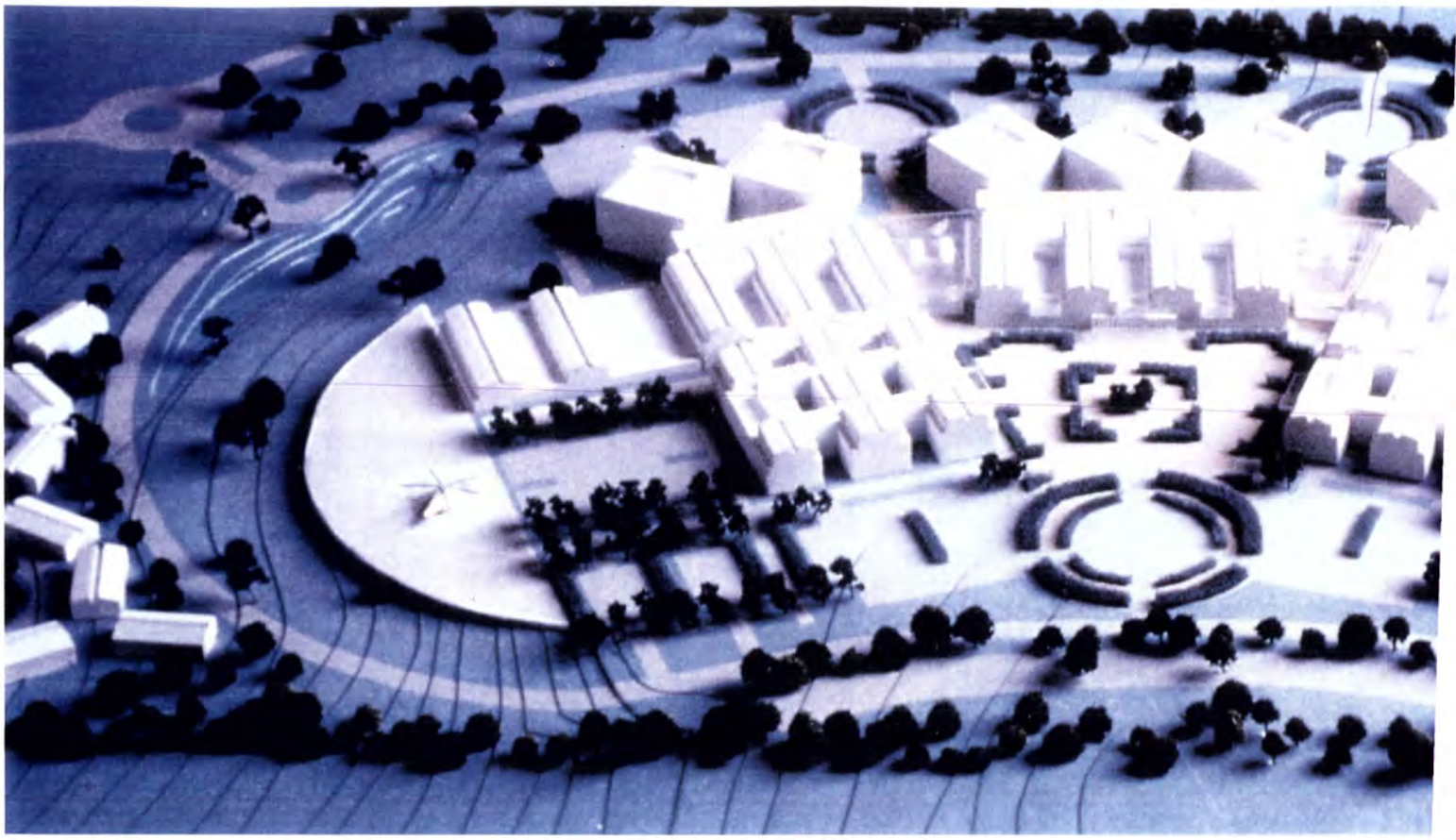
necessary methodologies to cope with this complexity. That means less competition and higher fees. Parker was confident that he and his colleagues had the necessary skills to make the design of these complex buildings a successful and profitable business.

But it wasn't until the early 1980s, after the retirement of Steve Allen, that Parker acquired a controlling interest in the practice and began in earnest to build an organisation on a scale to match his ambitions. He prides himself on his ability to make the right strategic decisions at the right time. The decision in this case was that he would relinquish his role as a designer of buildings and concentrate instead on designing the practice. Looking back now at the development of the practice over the last 15 years, it is clear that the decision was a good one: Anshen + Allen has grown from a local San Francisco practice into a international firm employing about 200 people. Hospitals and related building types such as research laboratories and university buildings, remain the core of the workload, and the practice's reputation in these fields has been steadily consolidated.

But it would be wrong to see Derek Parker simply as an architectural businessman. For him, the business and design are inseparable. Both require imagination and enterprise. According to Parker, the job of the architect, especially in health and research fields, is to understand and think creatively about the client's requirements. Establishing the right brief is just as important as designing a fine building. "We don't often talk architecture with our clients. We talk to them about their problems in their language. They expect the architecture. That is taken as read. We got tired as architects of being handed a brief without understanding the process that led up to it, its underlying social purpose. So for the last ten years, we've been doing what I call fishing upstream. We are now moving into pre-architecture. At the Royal Infirmary in Edinburgh, for example, we are not doing architecture at all. We are helping the client to think through what they should be doing in the next century. The architecture will flow out of that. We are using the architect's special abilities – to conceptualise, to make assumptions and to communicate using drawings, models, diagrams and sketches as well as words – in order to help clients analyse their present and future needs. This is what architects are good at. And what's more, unlike some other professions, we are idealistic and we care about more than just the bottom line."

The mention of the Edinburgh client highlights an important aspect of recent development in the practice: its connection with Britain. Parker himself, of course, is British, and so are number of key people in the practice. But the connection has several strands. Ten years ago, for example, when he was was looking around for suitable engineering consultants, having landed the important job of designing the Lucile Salter Packard Children's Hospital at Stanford, Derek Parker had the idea of visiting Ove Arup in London to see if they would be interested in setting up a San Francisco office. Ove Arup had offices all over the world, but none in the US. They offered an integrated engineering consultancy service of a kind that was not available from local firms. This would simplify the complicated business of designing the sort of heavily-serviced buildings to which Anshen + Allen was committed. And, of course, having the biggest engineering practice in the world on board would give Anshen + Allen a big advantage when competing for work. According to Ove Arup's senior partner, Duncan Michael, it was a risky strategy for both parties. "Derek probably scared himself to death. But he could see the prize if it worked. He would differentiate himself in the market, and he is a competitive person who likes to win the job. He is ambitious, but he has the brains to realise that he can't do it all himself, so he surrounds himself with good people."

Ove Arup and Partners has enjoyed a steadily growing workload in California ever since, and



Above *Master plan for the Norfolk and Norwich Hospital in the UK. Anshen Dyer are part of a consortium that will not only build the hospital but also run it with medical staff supplied by the UK's National Health Service*

now employs about 130 people. The relationship is a symbiotic one and the risky decision made ten years ago has paid off handsomely for both practices. When Ove Arup opened an office in Los Angeles, Anshen + Allen followed and the two practices shared premises for a while. It marked the progression of Anshen + Allen from local to regional status. The further progression to national status came in 1993 when the Baltimore practice Hord, Coplan and Macht was incorporated into the organisation, opening up opportunities on the East Coast.

The final step to international status came through another strand of the British connection. Having imported British engineering expertise to California, Anshen + Allen is now exporting health planning expertise to Britain through its London office, Anshen Dyer. Roger Dyer is an old friend of Derek Parker's who accompanied him on that round-the-world trip back in the 1960s. His partners now run the Cheltenham-based practice. When Prime Minister Thatcher's free market philosophy began to be applied to the British National Health Service, it was Roger Dyer who saw that there would be a demand for just the kind of health planning skills that were second nature to Anshen + Allen.

The contrast between the American and the British way of doing things sheds light on what is special about Anshen + Allen's approach. Thirty years ago British hospital design led the world. Architects like Howard Goodman and John Weeks were thinking innovatively about the architecture of healthcare and producing world class buildings. Parker himself acknowledges their influence. The concepts of flexibility, indeterminacy and brief formulation central to Anshen + Allen's approach owe a lot to those British pioneers. But by the mid 1980s the provision of healthcare buildings in Britain had become a rigid, over-centralised and bureaucratic process, exemplified by the nucleus concept which used a standard planning template regardless of the special requirements of different sites and different health authorities. The Thatcherite concept of an internal market in healthcare encouraged diversity and innovation rather than standardisation and control. There were lessons to be learnt from the American experience and it was time for Anshen + Allen to make its contribution.

So far, the London office has not produced any actual buildings. Most of its work has been in consultancy, advising Health Trusts in their "pre-architecture" planning. But in April of this year, Parliament gave the go-ahead for the building of Norwich Hospital under the Private Financial Initiative. Anshen + Allen is a part of a consortium that will not only build the building but will also run it, with the National Health Service providing the doctors and nurses. The preliminary designs for the hospital display the kind of clarity and realism that comes from decades of experience in hospital design. However, this is not a Californian hospital flown in and foisted on the East Anglian populace. Ken Schwarz, partner in charge of the largest privately-financed medical centre, and his US/UK colleagues are consciously trying to build a truly transatlantic practice that draws on British, as well as American, experience. "We are facilitators and we rely on the resources within the institution that is our client. We bring our experience, we bring specific examples and we can call in certain experts to help them. But these clients are bright people. They have travelled and they are informed, so this is really just a way to get that information that already exists in the institution out in an organised way. There is a tendency in the UK to be rather top-down about these things, but we encourage them to form teams which include administrators, doctors, nurses, porters, everybody, because good ideas don't just come from the top. Final reports are written by the teams, not by us. When it's finished, it's their plan, not ours."

The emphasis on pre-architecture in the Anshen + Allen organisation might seem to

"We are facilitators and we rely on the resources within the institution that is our client. ...we encourage them to form teams which include administrators, doctors, nurses, porters, everyone, because good ideas don't just come from the top."

suggest a lack of interest in the buildings themselves. This is very far from being the case. It is true that there is no house style, no chief designer and no architectural rule book. As a result, the buildings are stylistically varied, reflecting the particular tastes of the individual designers in the practice. It is also true that the practice as a whole is more interested in satisfying its clients than in pleasing the architectural critics. Nevertheless the quality of the final product is consistently high, architecturally as well as functionally. For Peter Stazicker, who heads the Los Angeles office, "architectural values" matter more than anything else: "The ambition of the office has always been to create an architecture of distinction. We believe our work evolves from known values and has a distinct identity."

There is no doubt that it is more difficult to achieve real architectural quality in hospitals and laboratories than it is in, say, churches and houses. But the example of Louis Kahn – his famous Richards Laboratories in Philadelphia and the Salk institute in La Jolla, California – is there to be followed and the Los Angeles office has enthusiastically taken up the challenge. Their addition to the Salk Institute was bound to be controversial. Here was one the great icons of twentieth century architecture, a spiritual place, a place of pilgrimage. How dare anyone even contemplate altering its surroundings in any way? It was like building next to Chartres Cathedral. Never mind that the great patron Jonas Salk himself was an advisor to the client, the East Coast critics were not going to like it, however good it was. In fact, it is very good indeed, largely due to the care lavished on it by David Rinehart, the 68-year-old architectural mentor of the Los Angeles office. Rinehart worked for Kahn on the original building, and he loves it with a passion. He was not about to desecrate it. His addition, designed with Jack McAllister, who was Kahn's project architect for the original building, is if anything too modest and deferential to the original. It is nevertheless an extremely accomplished exercise in Kahnian fair face concrete, glass and stainless steel. The underground reception hall beneath the plaza that separates the two new laboratory blocks is a noble space, its lack of height is cleverly compensated for by the dramatic concealed top lighting over the staircases on either side. Kahn himself would surely not have been dissatisfied. Other Anshen + Allen buildings, like the Packard Children's Hospital, the Tang Centre at Berkeley or the Green Earth Sciences Building at Stanford, for example, may not display the high Modernist, Kahn-influenced purity that characterises the work of the Los Angeles office, but they share the same integrity and commitment to design quality.

Anshen + Allen has completed 35 designs of university-based research laboratories in the last five years. These include several projects in the UK. Anshen + Allen is currently working on the Wellcome Trust Centre at the University of Oxford. This project is a joint response, requiring the total resources from the Cheltenham, London, Los Angeles and San Francisco offices.

Anshen + Allen is now firmly established internationally, with work in six countries, including Turkey and China. About a year ago, Derek Parker decided it was time to make another of his strategic decisions. The organisation, he felt, was becoming too bureaucratic and overheads were increasing. The practice was entering its third generation and it was time to hand over responsibility for its future to a group of enthusiastic and committed forty-something partners. All the talk among the most progressive business organisations was of downsizing and de-layering. In place of the old hierarchical management structure, Parker therefore proposed a looser commonwealth of autonomous offices. The full implications of this change are still being worked out, but the basic idea is that the individual offices should enjoy all the benefits of a small practice in terms of increased flexibility and faster decision making while still being able to call on the

Below *The Stanford Green Earth Sciences Building, California.* ***Bottom*** *The Lucile Salter Packard Children's Hospital at Stanford. Because of their context, these buildings may not display the High Modernist, Kahn-influenced purity that characterises the work of the Los Angeles office, but they share the same integrity and commitment to quality*

Timothy Hursley

Jane Lidz

available resources of the whole organisation.

This is a radical change with important financial implications, as Derek Parker explains. "The partners in each office have complete authority and are fully accountable. Their money is invested in their office. They don't have to ask for anybody's approval to buy a computer or a fax machine, but they have to pay for it. And there are internal billing rates for services exchanged between offices. The organisation is messier and more dynamic but the fact that more people now have a stake in the future of the practice is a great motivator and energiser. A whole layer of management has gone because we have self managers. New communications technology such as e-mail and video conferencing means that they have easy access to the information they need to make decisions."

Ed Hord, a principal in the Baltimore office, is enthusiastic about the new strategy: "We are trying to push responsibility and accountability as close as possible to the client. And the same principle applies within the office. Junior staff members also have good ideas and should feel that they have an influence on the way the office is run. We think of it as a participative democracy." Anshen + Allen evidently believes in practising what it preaches to its clients.

The new organisational structure has encouraged a more outgoing attitude in the practice. The closed hierarchy has become an open, extendible network.This is typified by the Design Alliance, a concept spearheaded by Romanian-born San Francisco Partner, Felicia Cleper Borkovi. Her idea has been to establish working relationships on a project-by-project basis with a group of talented individuals, architects, artists and designers, like the architect Panos Koulermos, University of Southern California professor, the interior designer Orlando Diaz-Azcuy, the architect Andrea Branzi, founder of the Domus Academy in Milan, the landscape architect James Burnett, and the artists Diana Schor, Al Garvey, James Carpenter and Atelier Jacques Simon. "Design Alliance is an informal concept," says Borkovi, "but it legitimises and provides a framework for links with designers outside the practice. We find that these designers are more than willing to collaborate with Anshen + Allen on projects of a type that they would not normally encounter." One might add that, like the association with Ove Arup and Partners, it is another way of differentiating the practice in the market place.

Under the leadership of the quiet Englishman, the practice has never stood still. The recent reorganisation has injected new blood and given it the agility and responsiveness to compete internationally. But like most of Derek Parker's decisions, this is a gamble. The risk is that the centre will not hold and the independent offices will decide to go it alone. But they probably won't, because the pool of resources is far too useful, both in architectural and business terms. This is the age of the network, and modern communication technologies have removed almost all geographical boundaries. If Anshen + Allen did not already exist, it would be necessary to invent it. **WA**

Design Alliance

Anshen + Allen (A+A), Andrea Branzi Architetto (ABA) and Domus Academy (DA) of Milan, Italy, have agreed to collaborate on a programme of design, research, cultural promotion and education. Theoretical design research developed in Milan and the large-scale, international planning and architectural practice of A+A together form a powerful force for innovation and change. A primary purpose of the collaboration is to create an integrated image for A+A, which is design research-based, socially responsible, and sensitive to the environment. The programme will unfold in San Francisco and Milan over the next five years under the umbrella of the Design Alliance, formed by Felicia Cleper Borkovi, partner at A+A.

"I believe my participation in the Design Alliance may have distinctive significance: it is the first time Anshen + Allen has established a collaboration, not within a certain specialised field for a project, but within an area of environmental and territorial experimentation, such as Italian and, in particular, Milanese design.

The last 20 years of my career, which began in the field of industrial design, have been aimed entirely at the research of new sensibilities and technologies and at the investigation of new urban and architectural models.

Similarly, Domus Academy, a post-graduate school of design, is moving – through its Research Center directed by Marco Susani – towards collaborating with producers of advanced technologies to identify critical scenarios to create new productive strategies.

Thus, the concept of this collaboration between Anshen + Allen, Andrea Branzi and Domus Academy is based on the fact that today the project can no longer be divided into simple fields of competence (design, architecture, and urban planning), but consists of a unique synergy of transformation acting simultaneously in many dimensions. In this way, the significant Anshen + Allen experience in certain highly specialised fields of architecture, combined with our capacity to envisage the new, from the small-scale to the large-scale and the metropolis, forms an ambitious promise for a collaboration between the United States and Europe that goes beyond the exchange of technical expertise.

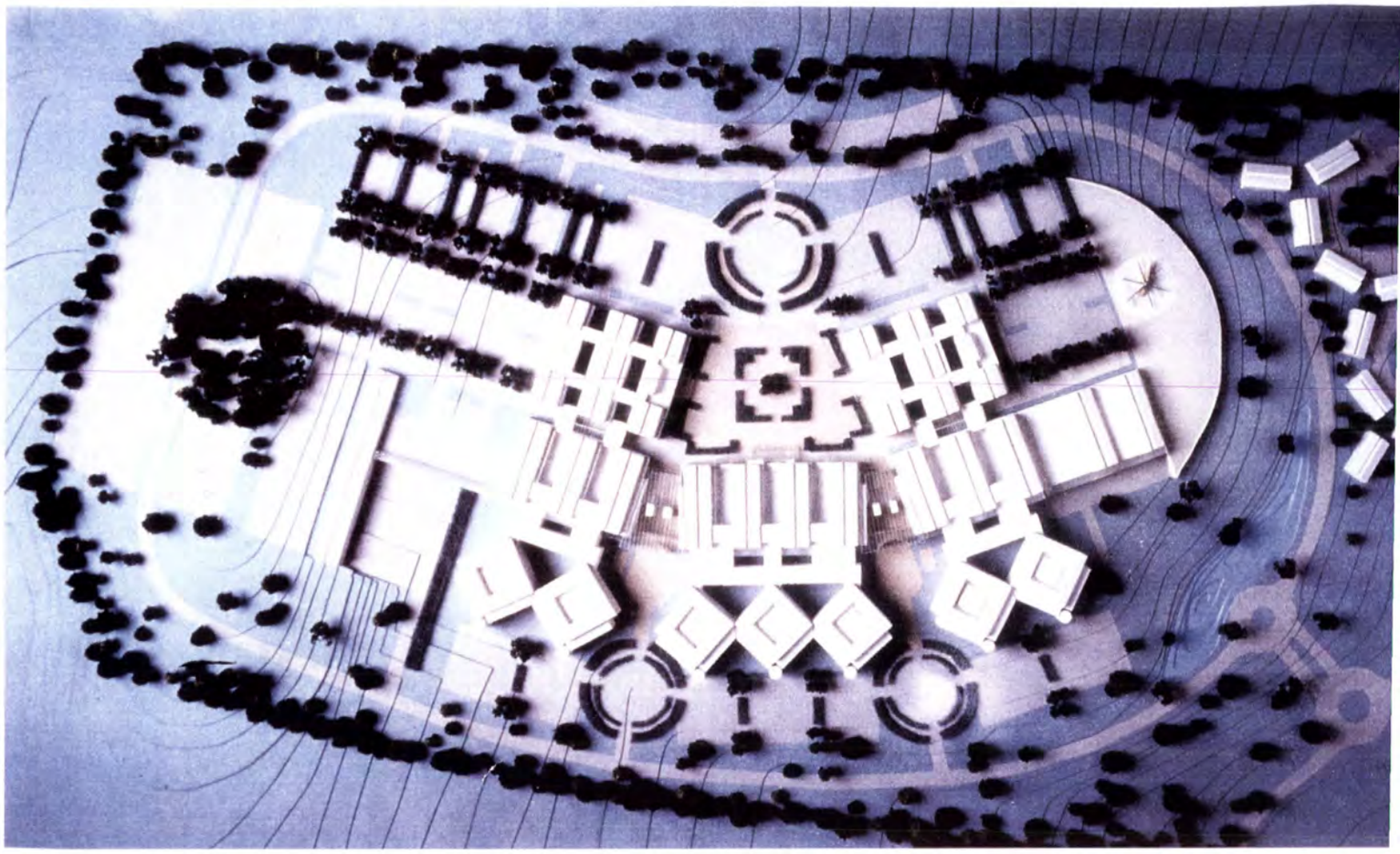
For almost 20 years Western architecture has abandoned every serious attempt at experimentation, but as times are changing, the current economic and production systems will only be capable of surviving their own limitations through constant reform and revision. In this sense, design can again be an important tool for this continuous transformation. This will only happen if we are willing to continually verify our own statutes and rapport with history.

The culture of Western design must be able to realise new sensory qualities and new architectural models. Not being afraid of the new, an understanding of real needs, the ability to form cultural theorems, and the willingness to detach from the improbable certitudes of formal composition are keys to the future.

The quality of the built world and the ability of designed space to offer new opportunities for relationships and knowledge constitute the major civil problem of the future. Culture and politics must succeed in building our cities better; otherwise, they will have failed."

Andrea Branzi

Andrea Branzi, architect, theorist and writer, is the founder of Domus Academy in Milan. His books include Moderno, Postmoderno, Millenario, Milan, The Hot House: Italian New Wave Design, Domestic Animals *and* Learning from Milan. *Awards include: Compasso D'Oro, 1987; the International Prize at the First Biennial Design Exhibition in Buenos Aires, 1983; the R Maxwell Prize by The Royal College of Art in London, 1989.*



Above *Aerial view of the physical model of the proposed new hospital and* ***below*** *computer model*

Norfolk and Norwich Hospital 2000, Norwich, England 1998

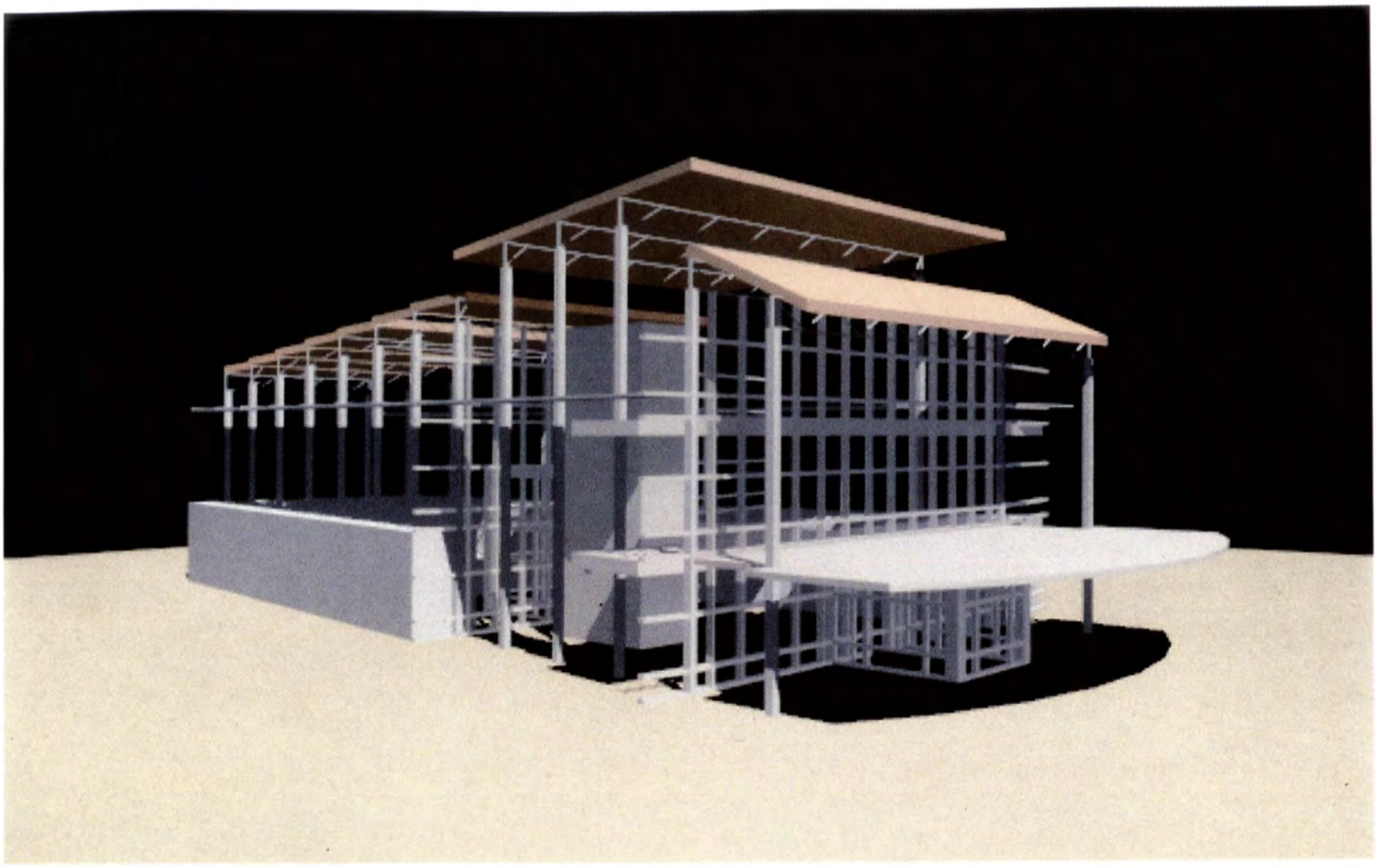
Clinical effectiveness, flexibility, cost efficiency, human-centred planning and environmental sensitivity are the keynotes of the design of this proposed new hospital.

The hospital will provide clinical support, inpatient and outpatient services, each accommodated in a unique building type suited to its functional requirements. Clinical Support is planned to facilitate the efficient clustering of hi-tech diagnostic and therapeutic elements. Inpatient areas are planned to maximise natural light and ventilation, to allow observation of patients from nursing stations and to provide support areas close at hand. Outpatient blocks are planned as clusters of clinic modules, each configured to balance the requirements of clinical efficiency with those of a less institutional environment.

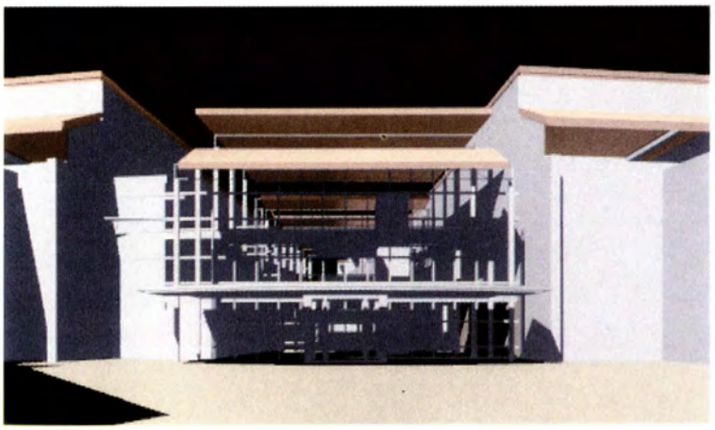
The diagram (functional relationships) shows the location of principal services and their functional adjacencies throughout the hospital. Note the bands of Outpatient, Clinical Support and Inpatient services, as well as the West, Central and East Pavilions that cross these bands. This matrix creates the setting for integrated services within specialities, which often require space in all three bands. For example, Cardiac Services has its Cath lab, CCU and theatres in the Clinical Support block, convenient to its Inpatient wards and Outpatient clinics on either side. Vertical adjacencies are equally important. Again for Cardiac Services, Accident and Emergency, Radiology and Pathology are located directly below.

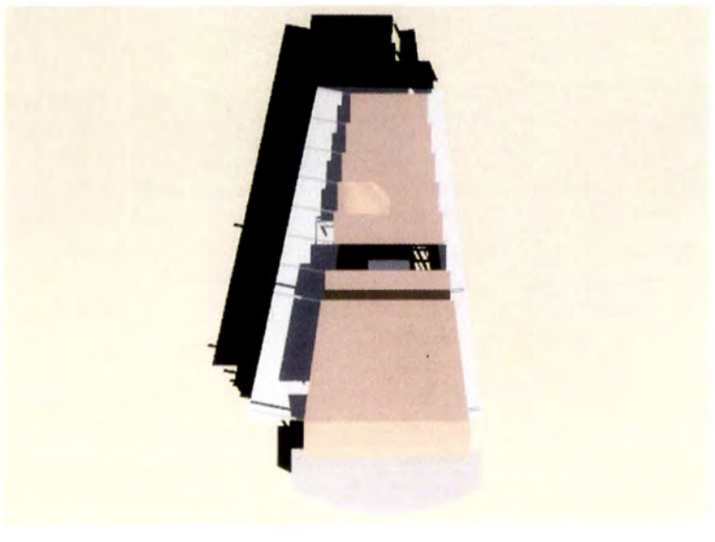
The East and West Pavilions are linked groups of Outpatient, Clinical Support and Inpatient blocks. In between, the Central Pavilions consist mostly of Clinical Support and Inpatient areas for surgery, with access to Outpatient services in the adjacent East and West Pavilions.

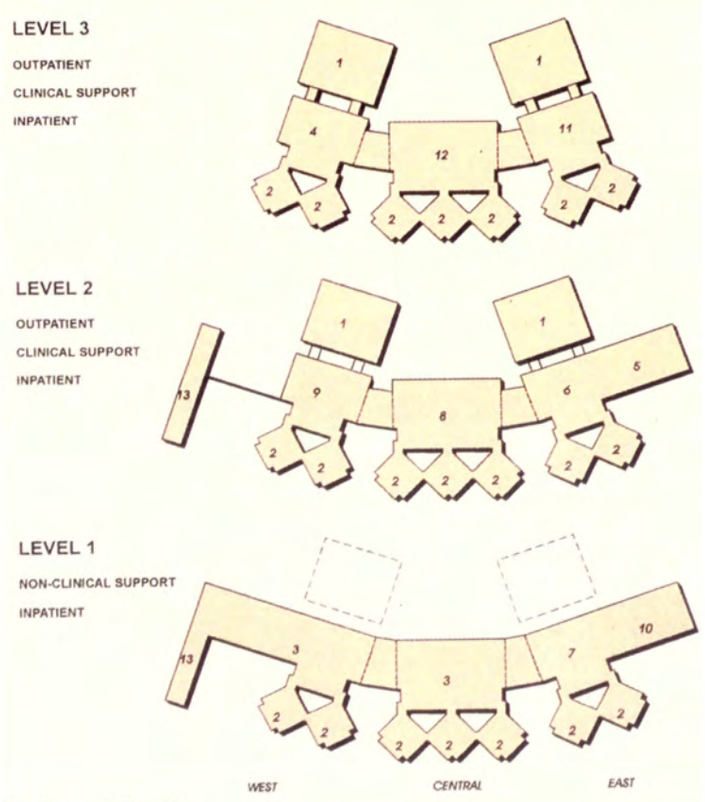
The site falls 12 metres from north west to south east. This makes possible entrances at both upper and lower levels to alleviate congestion. Buildings follow the contours, minimising cut and fill and reducing the overall height. Inpatient wards face south and have the benefit of distant views. A lake at the lowest point of the site controls storm water run-off and creates a reflecting pool across which the hospital is viewed from the main site entrance.



Above *Computer model of structural elements of one of the main entrance "modules".*
Below *Computer model of entrance elevation.* ***Bottom*** *Computer plan view*

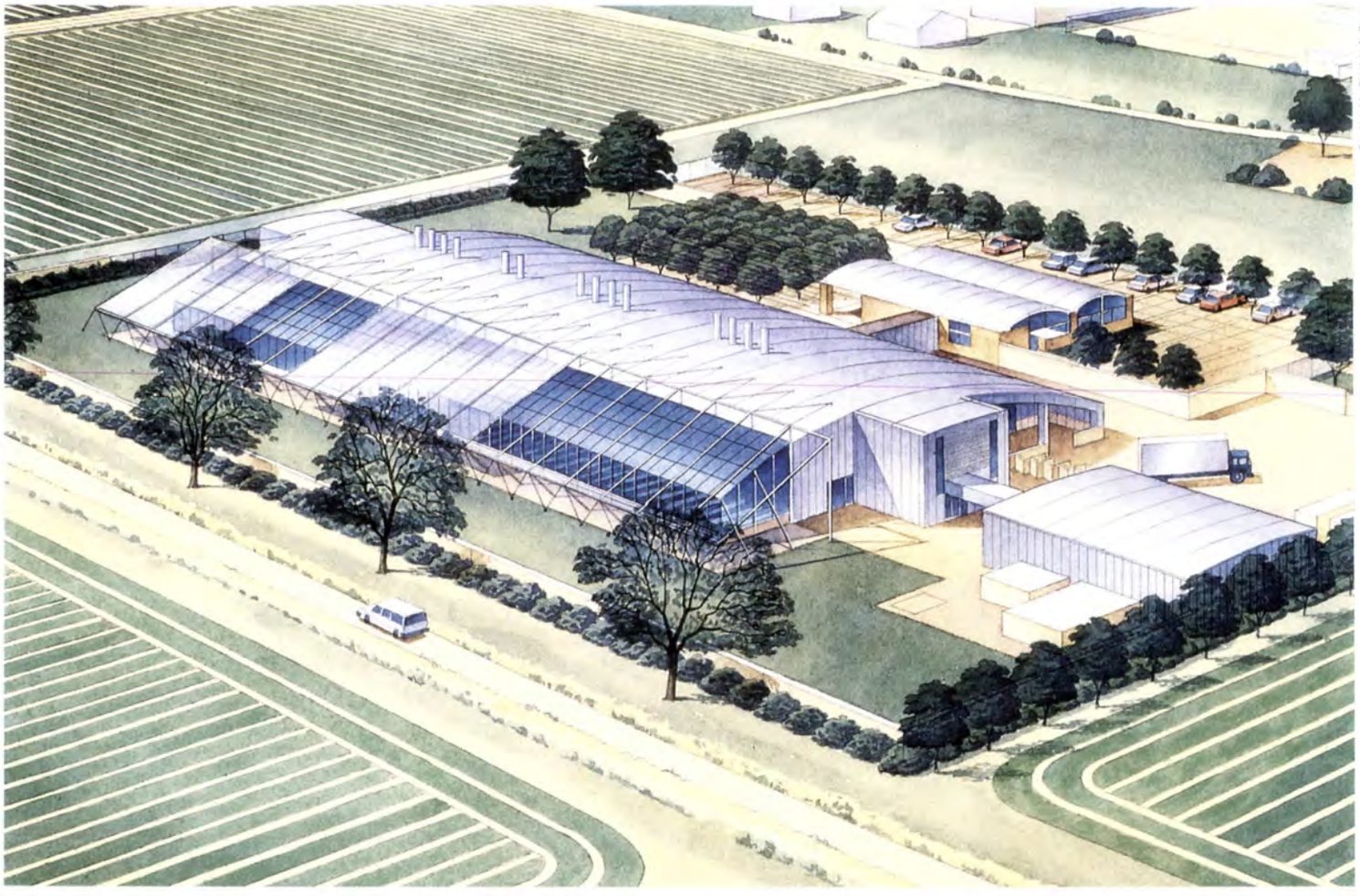


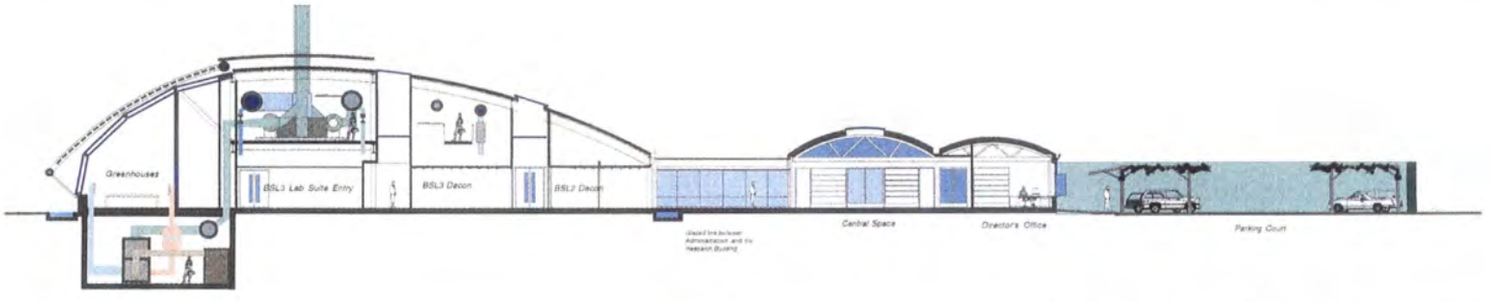




Functional relationships

1 Outpatient services
2 Inpatient services
3 Non-clinical services
4 Obstetrics and Gynae
5 Accident and emergency
6 Radiology
7 Pathology
8 Day procedures unit
9 Paediatric assessment
10 Oncology
11 Critical care
12 Inpatient theatres
13 Energy centre





Top *View from the south-east* ***Above*** *North-south section*

Contained Research Facility, University of California, Davis 1999

This 45,000 square foot pest control, quarantine and containment research facility has been designed to strengthen California's agricultural plant pest and disease prevention programme. The Contained Research Facility will allow research to take place which is currently prohibited by federal and state regulatory agencies due to the potential risk to the local agricultural communities if research organisms are accidentally released.

The facility will use the "hoteling" concept where both public and private research projects utilise lab and greenhouse space on a temporary basis. Specific research projects will include genetic engineering of plants and organisms to create natural alternatives to pesticides.

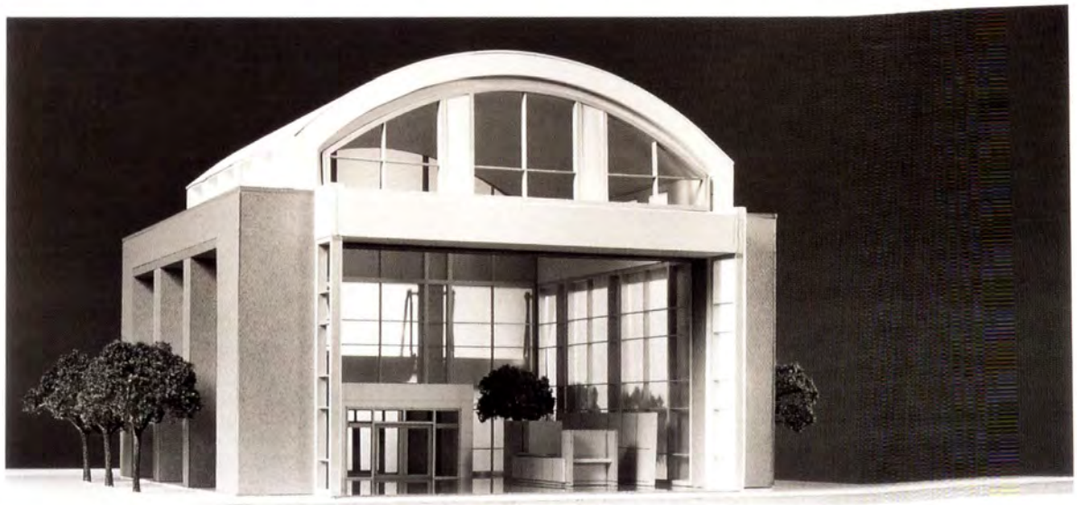
The research centre's three distinct programmatic elements are situated on the site in separate but related structures around a service yard, reminiscent of the farm complexes throughout the region. The facility is composed of an administration building, a high tech laboratory building which houses the contained labs, growth chambers and greenhouses, and a Central Plant building.

The curved roof form of the lab building allows for smooth passage of wind over the entire structure, allowing exhaust stack height to be lowered and eliminating exhaust re-entrainment problems into the building's air intakes. In addition, the curved roof over the greenhouses and labs acts as a single diaphragm which tremendously simplifies the building structural system.

The Contained Research Facility will be the first of its kind in the United States. It will have national and international appeal due to its unique ability to provide natural research conditions within a highly contained environment.

Below *Model view of whole project.* ***Bottom*** *Detail model of full height entrance lobby*

Robert Canfield



Robert Canfield

Kaiser Permanente Medical Center, Santa Clara, California 1999

The Kaiser Permanente Medical Center, Santa Clara is relocating from its current severely constrained site to a 53-acre open field site a mile away in the City of Santa Clara. The new campus is designed to serve the inpatient and ambulatory needs of its members into the next century. The site has been master planned for a maximum capacity of 450 beds, 450 provider offices, and parking for 3,600 vehicles. Ambulatory needs are provided in two Medical Office Buildings with different environments – one connected to the Diagnostic and Treatment portion of the hospital, and the second, a freestanding building, is linked across the campus by a series of pedestrian walks and courtyards. All entries are organised with ease of wayfinding in mind and easy access for the patient. Public circulation and waiting spaces within the buildings are organised around exterior courtyard spaces to further enhance the visitor's understanding of the organisation of the facilities and to aid in wayfinding. The heart of the campus will be a pedestrian park created by revegetating a natural creek that flows through the site. Patient rooms and medical offices are oriented around the parklike environment as an amenity for staff, patients and visitors.

The proposed Kaiser Santa Clara Medical Center replacement project consists of the following facilities:

- a hospital, 490,000 square feet;
- two medical office buildings, 675,000 square feet;
- a central plant, 36,000 square feet; and
- parking facilities, 3,600 cars.

Below right *Artist's impression of the dramatic addition to Shanghai's skyline*

WayToFund Building, Shanghai, China 1996

This international competition-winning design for a 1.2 million square foot commercial complex in Shanghai combines an office tower, a live/work tower and a shopping centre. A five-storey Great Hall serves as a grand entrance lobby but the largest and most dramatic public space is directly above the Great Hall: the Floating Pagoda Hall, a tower created from the negative space between the 20-storey office tower and the 25-storey live/work tower. The towers are connected by bridges at every fifth level. These connections allow space for tenant amenities such as restaurants, conference centres, exhibition halls and a museum. The Pagoda Hall leads upwards to two floors of banqueting hall and restaurant space at the pinnacle of the complex.

Located at the intersection of the Suzhou and Huang Pu rivers, the site's pivotal significance is more than geographic. A pedestrian plaza on the south side of the building extends the historic Bund promenade along the Huang Pu River. The WayToFund Building will become a symbol of transition between the Bund district and the modern, developing Pudong district.

Robert Watts

Below *Three views of a full size mock-up of the Intensive Care Unit of the future, designed to reduce ICU psychosis*

Farshid Assassi

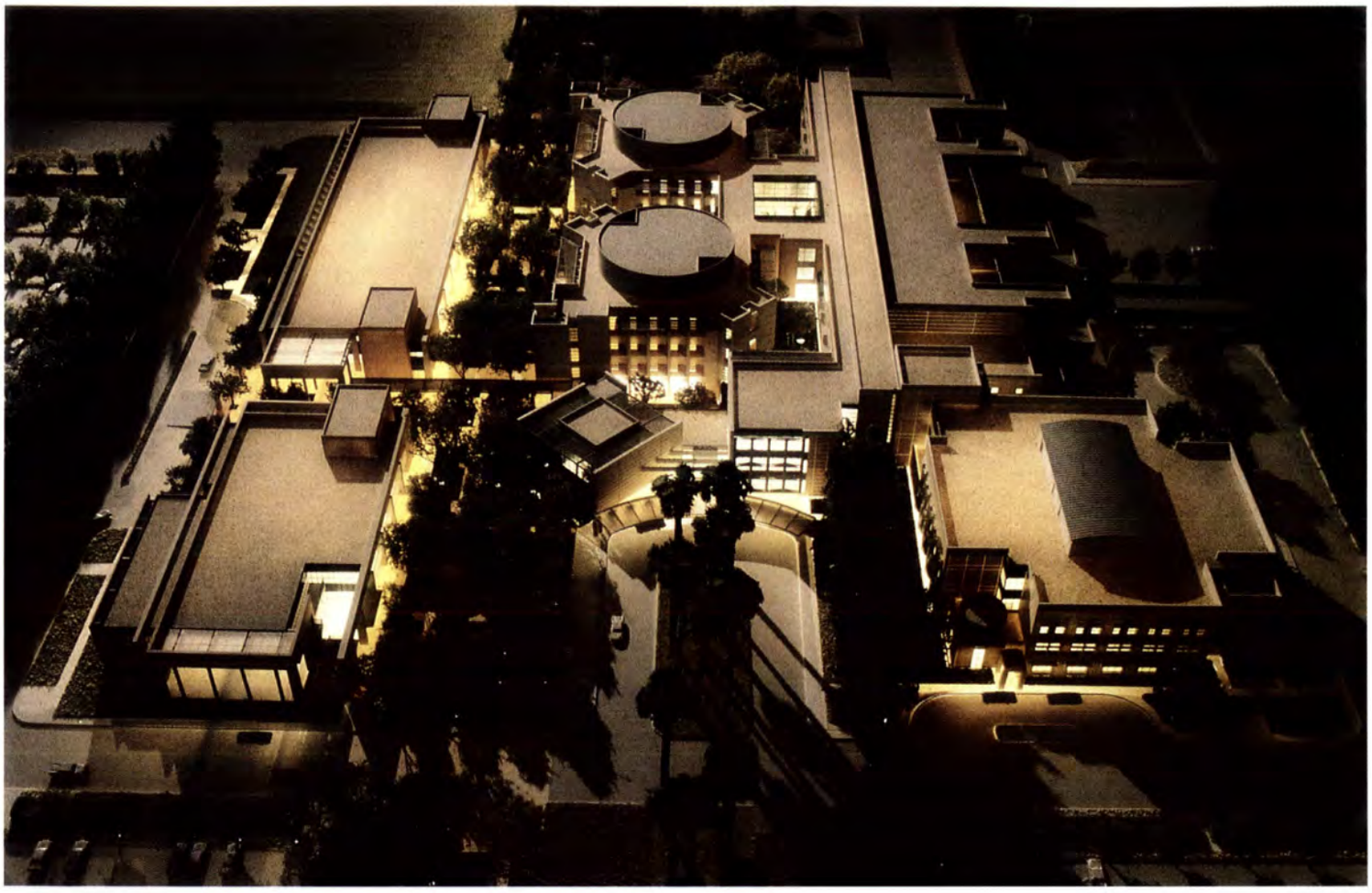
Farshid Assassi

Orlando Diaz

Intensive Care Unit Initiative

This prototype intensive care unit was designed by Orlando Diaz-Azcuy in collaboration with Anshen + Allen and constructed for presentation to the third Symposium on Health Care Interior Design in San Francisco (1990). The room is designed to prevent ICU psychosis, a condition of disorientation and hallucination which results from sleep deprivation, 24 hour lighting and the side effects of drugs. A 16 foot x 13 foot floor accommodates the four main components of intensive care: the patient, the medical staff, the family and the technology. A technology wall behind the bed contains all the life support machinery hidden in office-style cabinets. A toilet/sink unit is also hidden from view. The adjacent window is positioned so that the patient can see out, and the wall in front of the patient is finished in natural wood – a familiar and universally recognised material. The fourth wall is a nurse's observation wall, built from Varilite that changes from clear to obscure at the touch of a button. The ceiling, the plane that is most visible to the patient, is finished in a textured tile painted blue and defined by a frieze. The ICU is designed to be manufactured as a prefabricated module.

Below *Model view of the medical centre shows how a loose organisation of smaller buildings has been adopted in preference to the more traditional single large block, thus allowing for future expansion, greater flexibility in use, and operational economies*



AV Media

High Desert Medical Center, Lancaster, California 1999

Anshen + Allen was the executive architect with leadership responsibilities in a joint venture team with three other architectural firms selected by the Los Angeles County Board of Supervisors to provide master planning, programming, and design services for the new US$120 million High Desert Medical Center in Lancaster, California.

The master plan consists of a 550,000 square foot building complex on 80 acres. Situated on a broad expanse of desert highland northeast of Los Angeles, the Center will bring every kind of health care and health education service to a young, expanding community. It will be open to both county and private-pay patients and will be a focal point for the High Desert community. The master plan allows the Center to grow incrementally to meet the needs of an expanding population. By the years 2005-2010 it will serve the needs of a primary care area with a population of 600,000-750,000. This growth will include additional hospital beds as well as diagnostic and treatment departments and outpatient services.

In a move away from the traditional approach of consolidating functions in a dense, inflexible organisation, the project team recommended that the Medical Center should be a collection of smaller buildings. Anshen + Allen's Clovis Hospital was a prototype for the medical mall concept, in the "unbundling" of buildings to serve functions autonomously while part of a larger complex. The idea to separate function came as a solution to the following planning goals: to allow for future expansion and adaptation; to allow building systems to be tailored to specific uses; to achieve economies in construction and shortened project schedules; to achieve operational economies by allowing certain services to be shut down after hours; and to develop clear zones of service. Four building components were defined in addition to the Main Hospital: Outpatient Services, Conference and Administration, General Services and Central Plant.

The plan responds to the unique environment of the High Desert. Layers of enclosure define the large scale exterior spaces and lines of trees recall the agrarian character of the area. The whole complex is designed to promote healing and rehabilitation.

This project recently received a "Citation of Merit" recognition from The American Institute of Architects Academy for Health.

Block plan – Key

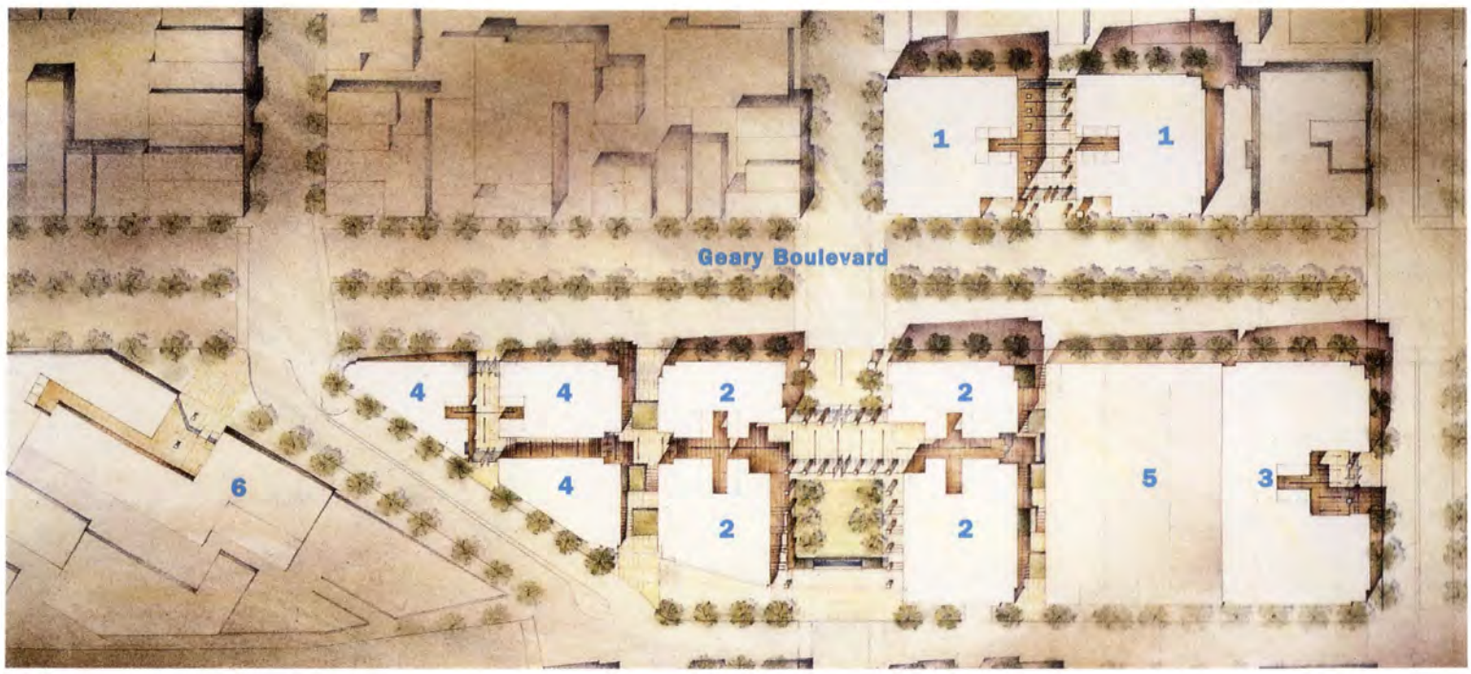
New construction

1. Medical clinics, phase I
2. Medical clinics, phase II
3. Medical clinics, phase III
4. Administrative support

Existing construction

5. Parking structure
6. Hospital

Below *Rendered block plan.* ***Bottom*** *The first proposed building of the development*



Rendering by Bruce MacDonald

Kaiser San Francisco Medical Center, Medical Office Campus, California 1998

The proposed ambulatory campus is being designed to permit adaptation to an ever broader range of medical services and procedures, a hospital without beds. The site comprises several blocks on both sides of Geary, approximately two miles from the business district. The campus will be developed in several phases through to the year 2006. Upon completion, the ambulatory facilities will be substantially larger and potentially independent of the existing hospital.

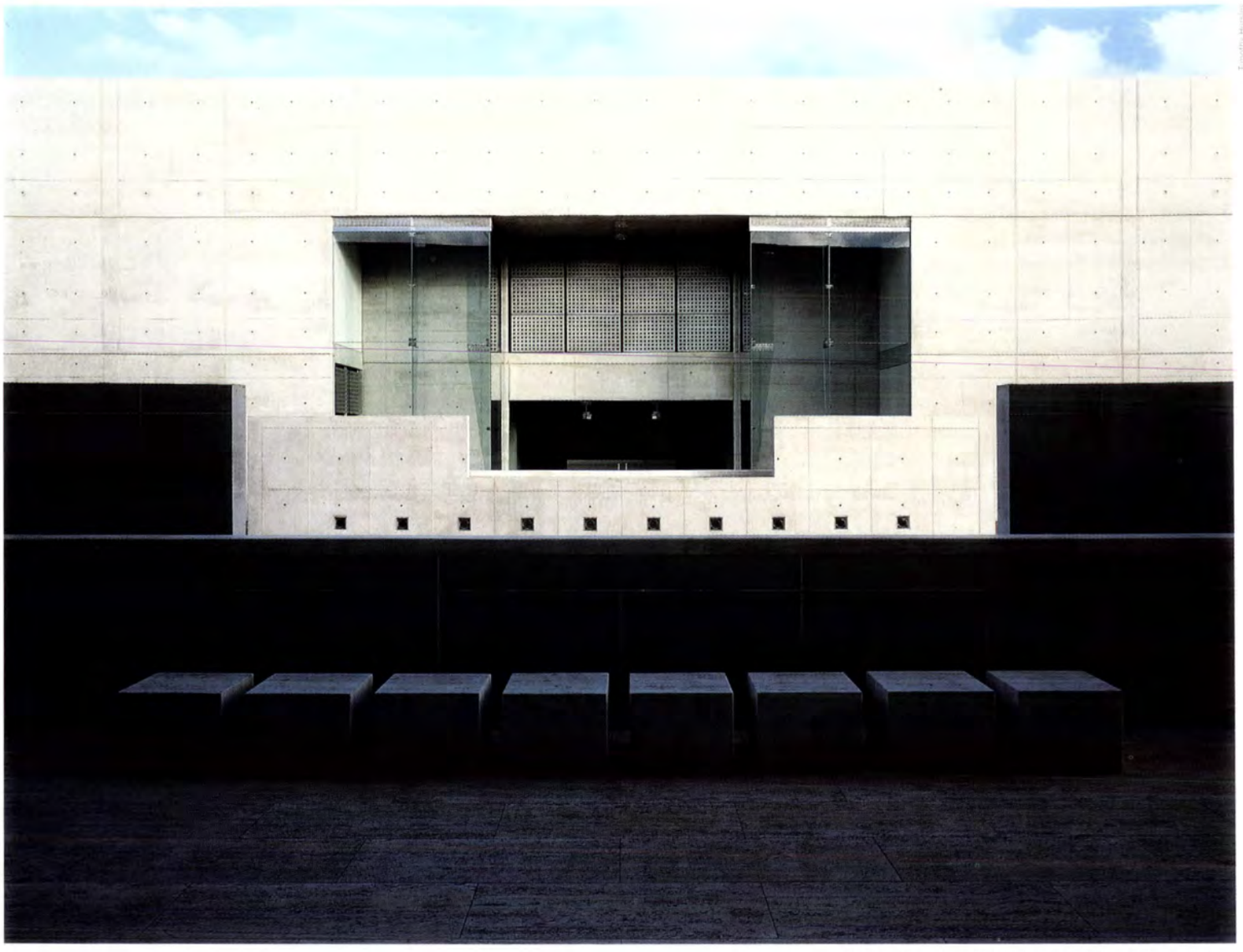
The medical centre is designed to integrate into the community and urban fabric of the surrounding neighbourhood, both in physical form and in function. The buildings cover their sites, creating unified street edges on the sidewalks, enriched with retail activities on the ground floor. The voids between the buildings are treated as "exterior rooms" woven into the existing street pattern.

The first proposed building is an eight-storey structure with approximately 260,000 square feet of floor area above grade and a four-level, 380-car parking structure below grade. The recessed centre bay coincides with the three-storey entrance lobby and atrium.

The lobby is intended to be a welcoming space with retail activities at the ground floor and waiting areas opening into the atrium on all levels. The space is designed as an enclosed street with the fenestration pattern and colour of the exterior walls brought into the interior.

A typical floor contains a common waiting zone in the centre of the building, adjacent to the main elevators and bisecting the building. This will allow each of the four clinics to have its own reception and waiting area, or for each half of the building to function as a Primary Care Module, integrating a broad range of medical specialties and treatment space at a single point. All plan layouts are as generic as possible to permit flexibility of use. Natural daylight is being introduced far into the clinical core through high perimeter ceilings and windows and interior transoms. All offices and public corridors are naturally lit to some degree. Indoor lighting fixtures in these areas are on rheostats controlled by occupancy sensors and photo cells.

Rendering by Bruce MacDonald



Timothy Hursley

This page and opposite *The new addition to Louis Kahn's Salk Institute shows due deference to his masterpiece and reflects the essential duality and unity of the original*

East Building, The Salk Institute for Biological Studies, La Jolla, California 1995

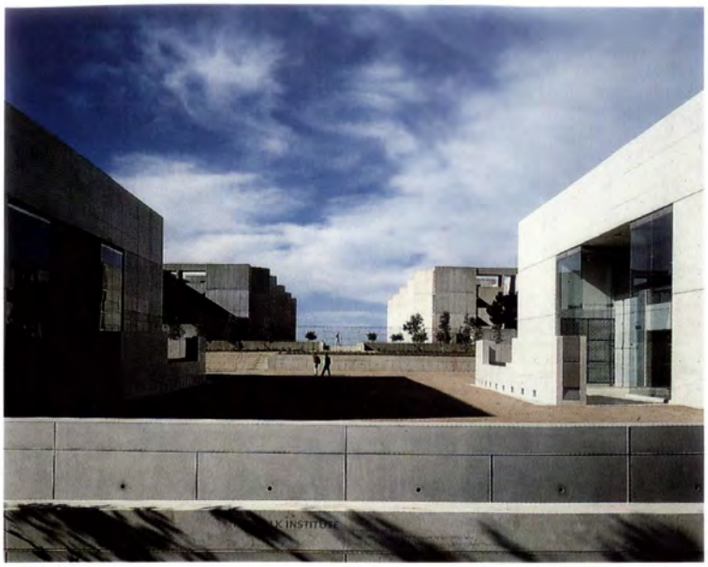
The existing Salk Institute, world famous among both scientists and architects, was designed by Louis Kahn in the early 1960s. Two laboratory buildings stand north and south of a paved court overlooking the Pacific Ocean. The buildings are physically and symbolically unified by the court. Duality and unity are the essence of the Salk Institute, and this theme is continued in the new East Building. It is positioned, on axis, 124 feet east of the existing building. This location satisfies the programme but retains a grove of trees through which Kahn's court is approached.

Like the original building, the new 113,000 square foot East Building also consists of two wings placed north and south of an open court. Each wing accommodates a diverse range of uses with dry laboratories on the ground floor, wet laboratories on the upper floor and support functions in the basement.

The facades that face each other across the court are simple, monumental compositions in fair face concrete, pierced by double height entrance portals infilled with frameless glass. Great care was taken to match the quality of the concrete in the original building, with its characteristic expressed formwork joints. Symmetrical staircases flanked by light wells descend from both entrances to a large reception and exhibition hall beneath the plaza. This space links the two wings and also serves as a foyer of a large underground auditorium.

The duality and unity of the original building is reflected in the duality of the East Building's wings and the unity of its entrance court and underground reception hall. The whole complex in turn reflects the dualities and unities of east and west, north and south, court and grove, ocean and land.

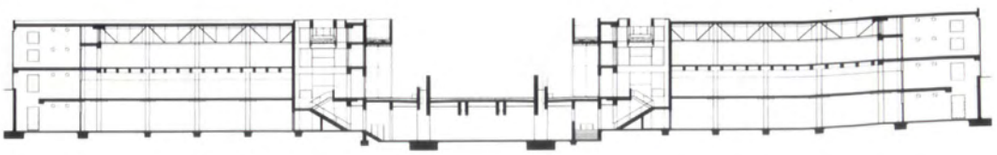
Timothy Hursley

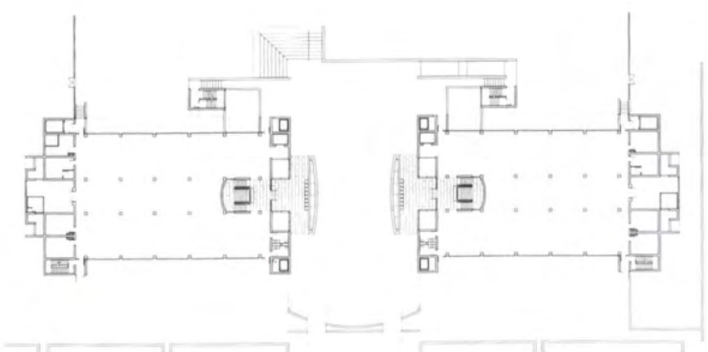


Timothy Hursley

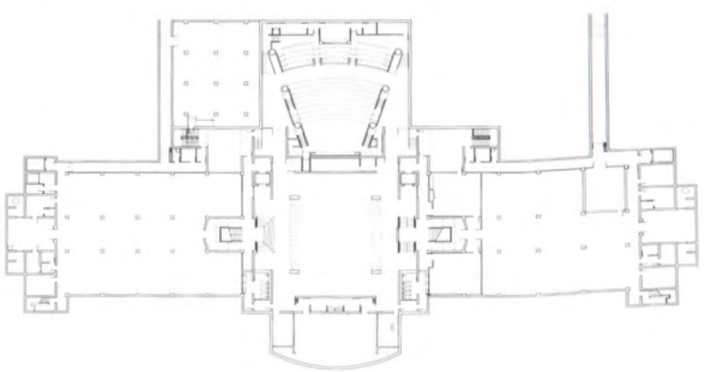
Timothy Hursley

Longitudinal section





Ground level plan



Lower level plan

Below right *A curving screen marks the entrance to the medical centre.* ***Bottom*** *Indoor courtyard with fountain and, in the background, an example of the extensive art-work programme*

St Joseph's Medical Center, Stockton, California 1995

St Joseph's Medical Center is a 316-bed facility located in a suburban area of Stockton. The initial development plan (1984) was driven by the need to improve antiquated nursing units, and respond to the rapid expansion of outpatient programmes. In 1985 a pilot project for the conversion of an existing nursing unit from a traditional racetrack plan to a cluster configuration, became the model for the subsequent renovation of existing nursing units throughout the institution.

In 1988 a second series of projects focusing on the expansion of outpatient facilities was completed. The projects consisted of a cluster of freestanding diagnostic and treatment centres and supporting facilities organised in a "medical mall". The new facilities included an outpatient surgery centre, a cancer centre, a rehabilitation centre, new registration and lobby areas, a parking structure, and a heliport.

These projects combine to create a supportive environment with terraced landscaping, fountains, and an indoor courtyard. To accommodate parking on the restricted site, the garage is located on the lower level only a few steps away from the mall. An unusual feature of the project is the extensive artwork programme, including paintings, sculpture, tapestry, and stained glass.

In 1990, Anshen + Allen was engaged to update the 1984 development plan, taking into account the latest healthcare trends. The new development plan provides a framework for the expansion and renewal of the campus over the next 30 years.

The first phase of the master plan, completed in March of this year, consists of a two-storey Heart Center which consolidates Cardiac, Peripheral Vascular and Pulmonary services, an expanded Emergency Department, expanded Ambulatory Surgery, an Art Gallery and a new Entrance Piazza and Colonnade designed in collaboration with architect Panos Koulermos.

Robert Cianfield

Below *Naturalistic landscaping provides a link to the existing woodland of the forest setting.* ***Bottom*** *Public and private spaces are designed to provide a non-institutional, home-like atmosphere*

Sharon Risedorph

Hospice of the Central Coast, Monterey, California 1994

The hospice provides palliative and supportive care, including skilled nursing, psychological and emotional support, spiritual guidance and bereavement services to dying people and their families. Situated in a tranquil forest setting, the building creates a non-institutional, home-like atmosphere.

The 28 patient rooms are divided into two groups. The intimacy of this arrangement emphasises the privacy of the individual patient and his or her family, while maximising operational efficiency. Patient rooms are designed to encourage personalisation within an overall interior design framework and family "living rooms" are provided. Nurse stations are strategically placed within each group. The interior is light and airy with generous windows, clerestories and skylights. The natural beauty of the site is captured in large glazed areas and enhanced by vaulted ceilings in the primary spaces. Outdoor patios, courtyards and gardens have been provided in public areas and all patient rooms have balconies. Naturalistic landscaping provides continuity with the existing woodland environment, and external materials are residential in character and scale.

Farshid Assassi

Farshid Assassi

Timothy Hursley

Left *View from the north end of the central corridor which leads through the courtyard and the laboratory wing towards the centre of campus*

Bourns Hall – College of Engineering, University of California, Riverside 1994

In 1990 Anshen + Allen was commissioned to design a master plan for the College of Engineering at the University of California, Riverside.

The Riverside campus had remained largely undeveloped since its initial building programme in the 1950s and 60s. A statistical long range development plan anticipated growth from approximately 5,000 students to over 20,000 by the year 2000. The College of Engineering was to be the flagship project to lead this important growth. In addition to addressing the design issues of campus form, building densities, circulation, massing and planning, Anshen + Allen also developed an academic mission, collegiate format and programme verification with the Dean and University administration.

The Engineering Building provides research, classroom and administrative space for the newly established College of Engineering. It is a 160,000 square foot complex, providing space for the electrical, bio-chemical, environmental, and computer disciplines. It houses research, instructional laboratories, and faculty and administrative spaces, as well as a specialised computer visualisation and imaging research laboratory. The proposed second phase, Unit II, is a 74,400 square foot building providing similarly designed accommodation for mechanical, engineering and mathematics.

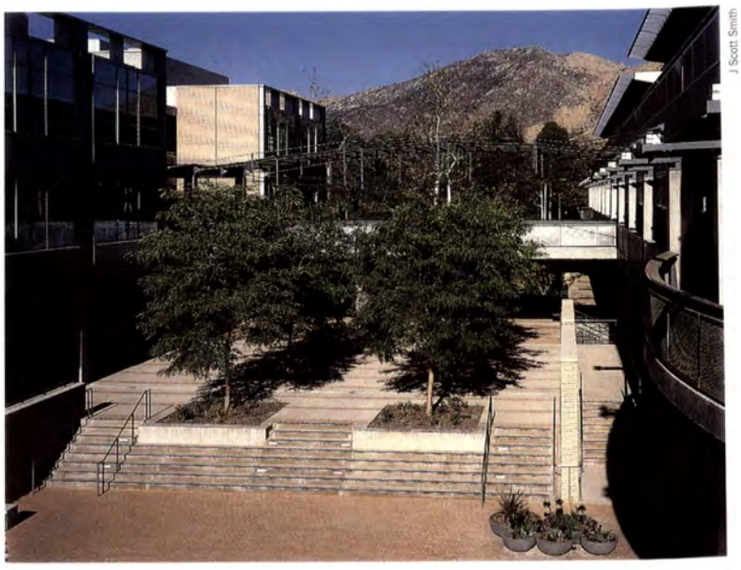
The two wings are sited on either side of a landscaped court and are connected by open air bridges and circulation balconies. The programme, which was organised into separate laboratory and office structures, inspired a modular design responding to the need for highly flexible research and support space in the constantly changing field of engineering research.

The project has received numerous awards, including the AIA National Honor Award for Design.

Timothy Hursley

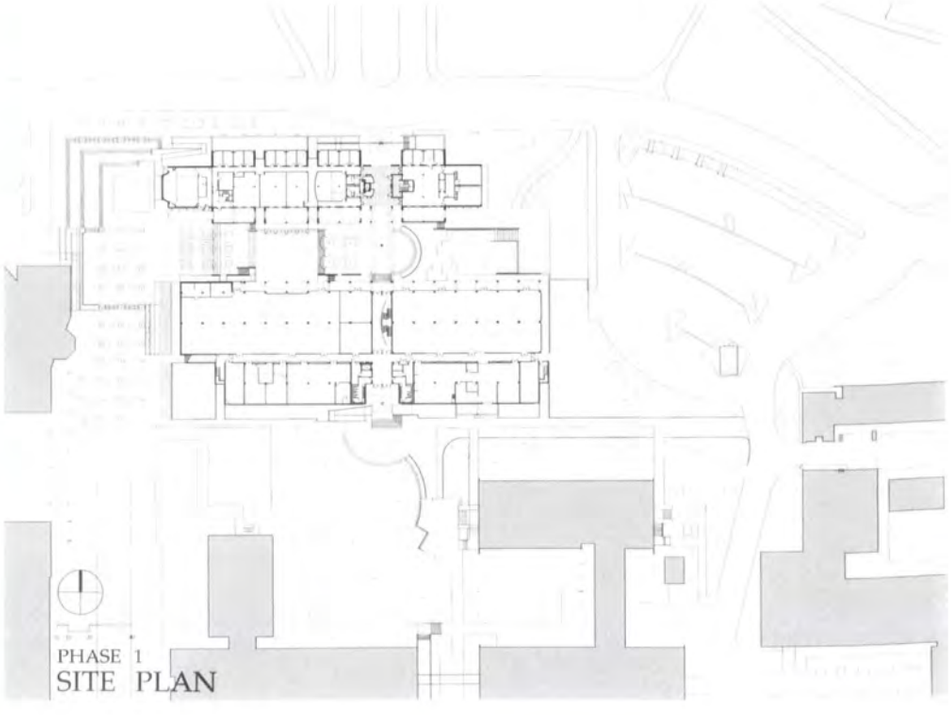
J Scott Smith

J Scott Smith



Above *Open circulation walkways overlook central courtyard.* ***Top right*** *Main entrance in Unit 1.* ***Right*** *Open air bridge spanning landscaped courtyard.* ***Below*** *Sculptural staircase in Unit 1*

J Scott Smith

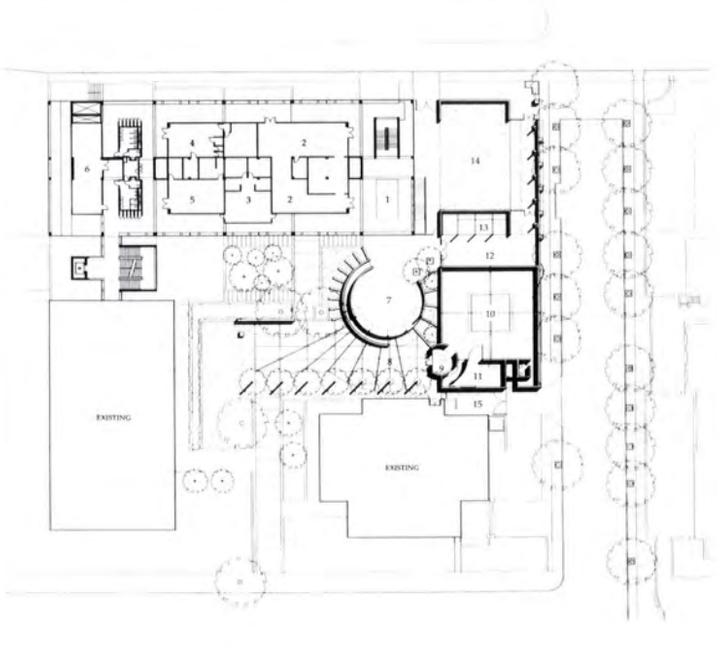


Farshad Assassi

Above *View of studio court and entrance to the Williamson Art Gallery.* ***Below right*** *Ground floor plan*

Millard Sheets Art Center, Scripps College, Claremont, California 1994

The US$2.6 million Millard Sheets Art Center is the focus of the Fine Arts Curriculum at Scripps College. The 22,000 square foot complex, including new and renovated buildings, houses faculty offices, traditional studios, multimedia, photography and computer laboratories, and the Williamson Art Gallery. The design emphasises the connections between the new Art Center and the original Scripps Campus with its historic buildings. At ground level a landscaped outdoor plaza provides informal spaces for study and faculty/student interaction.



Key

Renovation

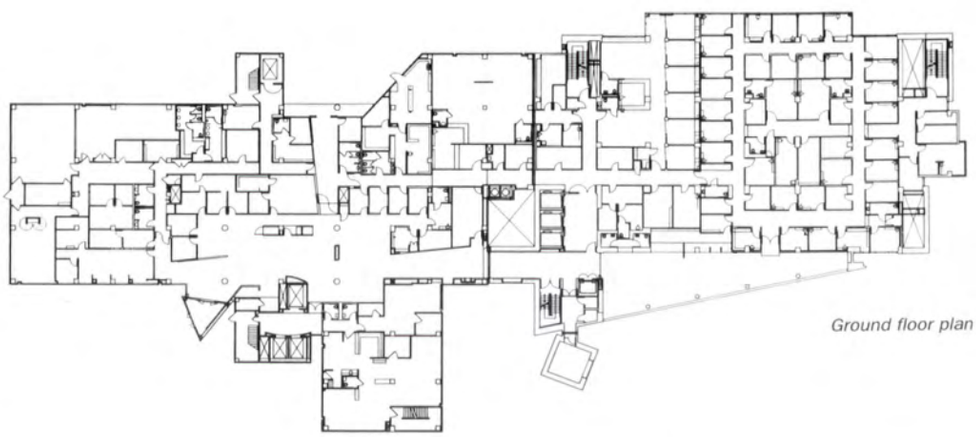
1 Covered walkway
2 Ceramics studio
3 Department/lobby/ offices
4 Print studio
5 Photo studio
6 Printing press

New construction

7 Studio court
8 Gallery court
9 Gallery lobby
10 Gallery
11 Work room
12 Ceramics yard
13 Kilns
14 Sculpture yard (future sculpture studio)
15 Service

Below *Artist's view of the new Cancer Hospital and Research Institute*

Rendering by Walter Tomason



Ground floor plan

Kenneth T Norris Jr Cancer Hospital and Research Institute, University of Southern California, Los Angeles 1994

This nationally recognised facility is one of only 21 Comprehensive Cancer Centers affiliated to the National Cancer Institute. The University of Southern California's aim is to create a hospital that is at the forefront of cancer research but also provides a sensitive specialised environment for patients.

The new 183,000 square foot building provides expanded accommodation for applied research, allowing for 15 additional Principal Investigators, bringing the centre's total to 30. The facilities include expanded office areas for the divisions of Cancer Cause and Prevention and Clinical Investigations. These offices are also used by the Hospital's physicians.

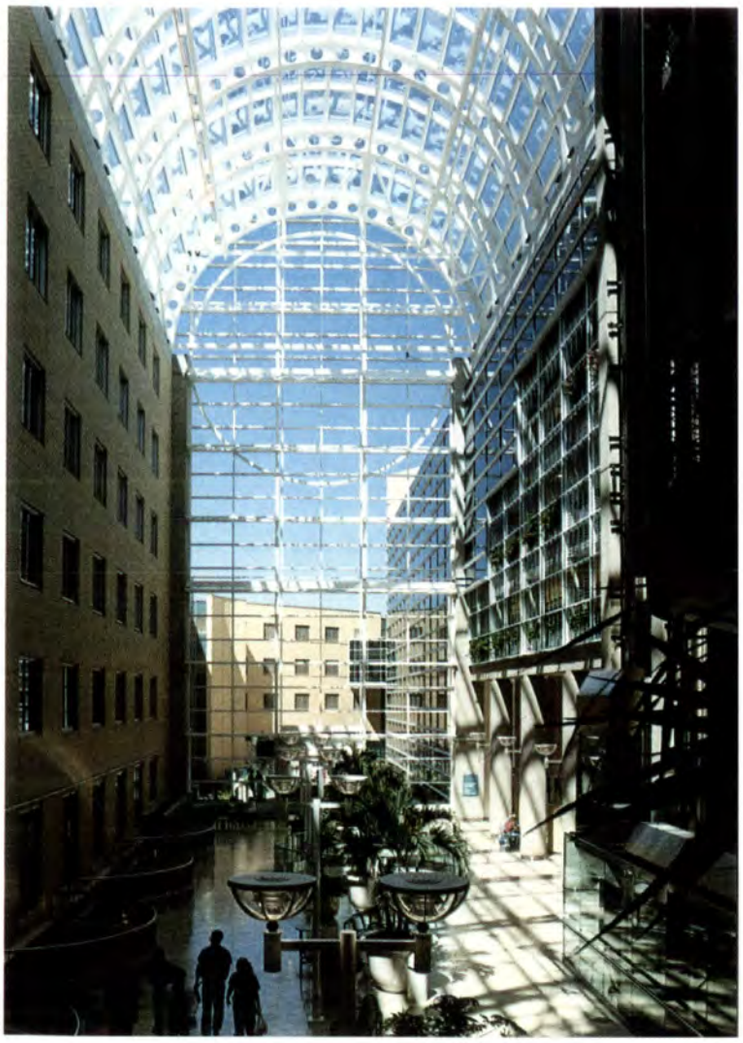
A new main entrance leads to a medical mall, allowing easy access to hospital admissions, outpatient clinics, an enlarged day hospital, a health and education centre and commercial space, including a pharmacy. The mall overlooks a quiet, specially landscaped garden.

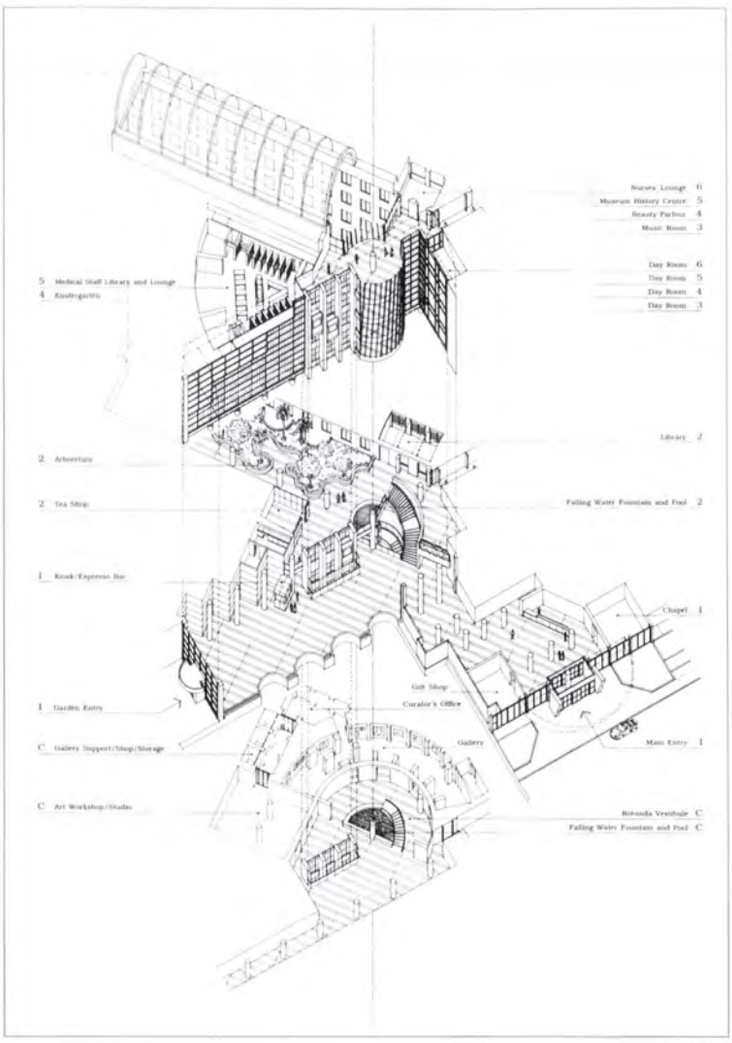
Additional elements of the project include a conference centre, an enlarged clinical laboratory, a materials management facility and a loading bay.

Orlando Diaz-Azcuy was the interior design consultant, and the landscaping was designed by Delaney and Cochran.

Below *Six-storey glass atrium links new building with existing hospital.* ***Below right*** *Rotunda amenity study*

James Dow





Diagnostic, Critical Care and Treatment Centre, Royal Alexandra Hospital, Edmonton, Alberta, Canada 1994

Part of an overall redevelopment programme at Royal Alexandra Hospital, an urban teaching hospital, the project included approximately 450,000 square feet of new additions and 70,000 square feet of renovations to existing facilities. Anshen + Allen led the project during the master planning, programming and block diagram phases (the Canadian equivalent of schematic design and design development) and local architect Wensley Spotowski Architectural Group, led the construction documents, bidding, and construction administration phases.

The new addition consists of complete emergency, diagnostic imaging, laboratory, and surgical departments. Also included are: adult intensive and cardiac care units; facilities for pulmonary function testing, neurological, respiratory and cardiac services; a replacement materials management centre; and a new physical plant. Full interstitial floors with walk-on decks provide services to radiology, laboratory and surgery. The existing hospital is connected via a six-storey, glass-enclosed atrium with circulation bridges at the upper levels.

Renovation work took place on the ground level and two basement floors. The departments included are: administration and housekeeping; a satellite admissions laboratory; morgue and autopsy procedure areas; and ambulatory surgery department.

The project was designed entirely on CAD, which also provided a facilities inventory of the 1.3 million square foot medical complex.

Robert Canfield

Left *Main entrance.* ***Below*** *Five-storey atrium linking building to parking garage*

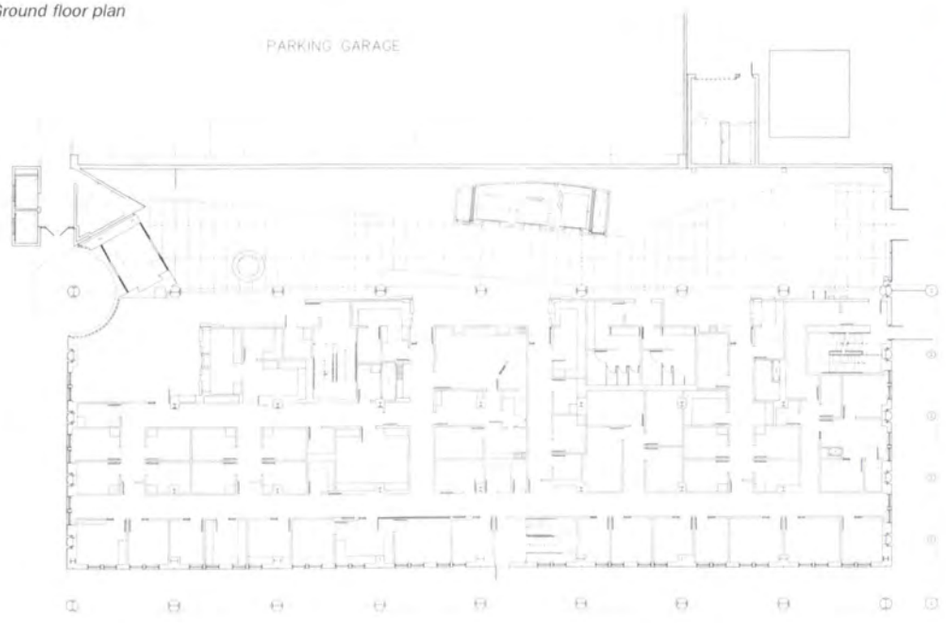
Outpatient Center, Children's Hospital Medical Center of Northern California, Oakland 1994

The Outpatient Center is Phase II of a ten-year expansion programme for the hospital's campus. A full-height, five-storey atrium connects the building to the parking garage, and a third-floor bridge provides access to the main inpatient building.

The new building contains an ambulatory treatment centre, same day surgery, and a sickle-cell centre. Departments include paediatric anaesthesiology, audiology, gastroenterology, haematology/oncology, infectious diseases, orthopaedics and pulmonology. Support spaces include radiology, a satellite laboratory and pharmacy, a media centre and hospital information services.

Other functions housed in the centre are the health sciences library, medical staff offices, medical education offices, physicians' and residents' lounges, conference rooms and a 175-seat auditorium.

Ground floor plan



Robert Canfield

Timothy Hursley

Above *North side of the laboratory building showing the basement level sunken courtyard.* ***Below*** *Deeply recessed door and window openings*

Green Earth Sciences Research Laboratory Building, Stanford University, Palo Alto, California 1993

The new Earth Sciences Research Laboratory Building, built with funds provided by Cecil H and Ida M Green, is part of Stanford University's Near West Campus redevelopment. It accommodates laboratory and shop space, offices, conference and seminar rooms, computer facilities and classrooms. Laboratory requirements include highly complex electrical and telecommunications systems, magnetic shielding, and high temperature/high pressure facilities with explosion protection.

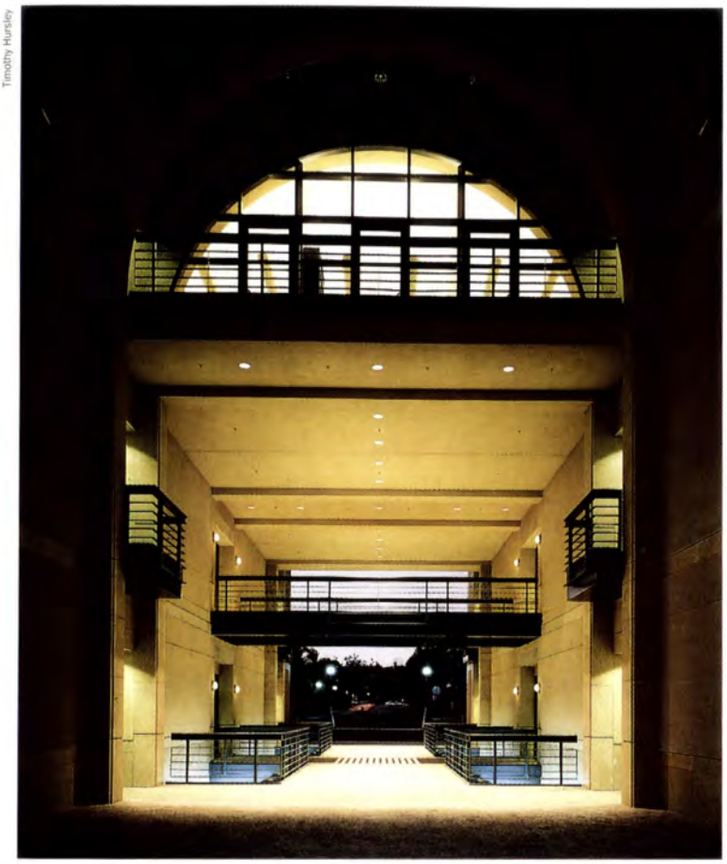
The four-storey building (three above ground plus an extended basement around a sunken courtyard) forms a focal point on the principal axis of the Near West Campus Plan. The planning guidelines required that it should harmonise with the Main Quad, using the colours, textures, roof forms, and arcades that are distinctive of Stanford University. Windows and doors in the exterior walls are deeply recessed and materials include stone, stucco, and terracotta tiles.

The arched portal that connects the two halves of the building was originally intended to be full height, with connecting bridges at all levels. However, after the Loma Prieta Earthquake in 1989, it was decided to infill the third level bridge to create additional floor area and compensate for lost square footage elsewhere on the campus. Bridges remain at the first and second floors. Offices on the third floor enjoy views up and down the mall.

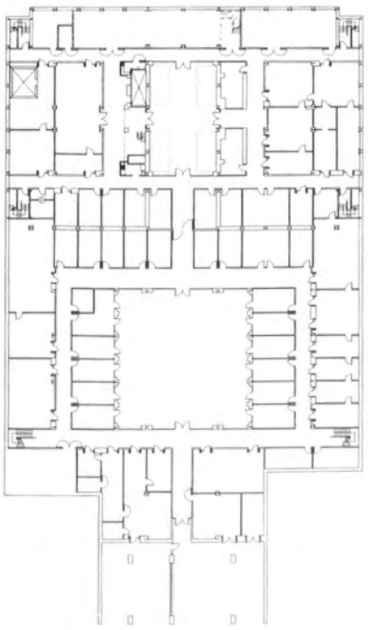
Timothy Hursley

Below left *The arched portal connecting the two halves of the building.* ***Below*** *View up from basement concourse level of the connecting archway*

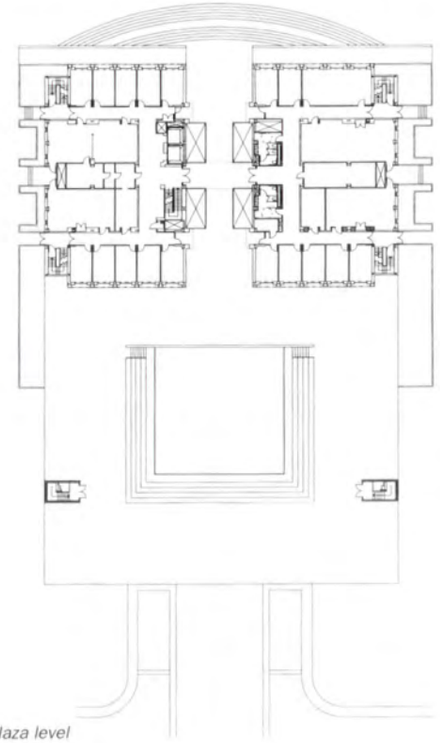
Timothy Hursley



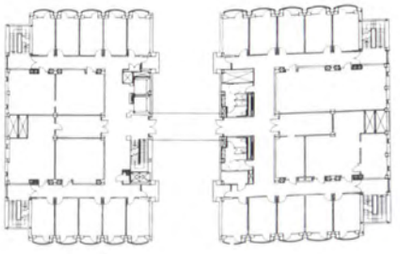
Timothy Hursley



Concourse level

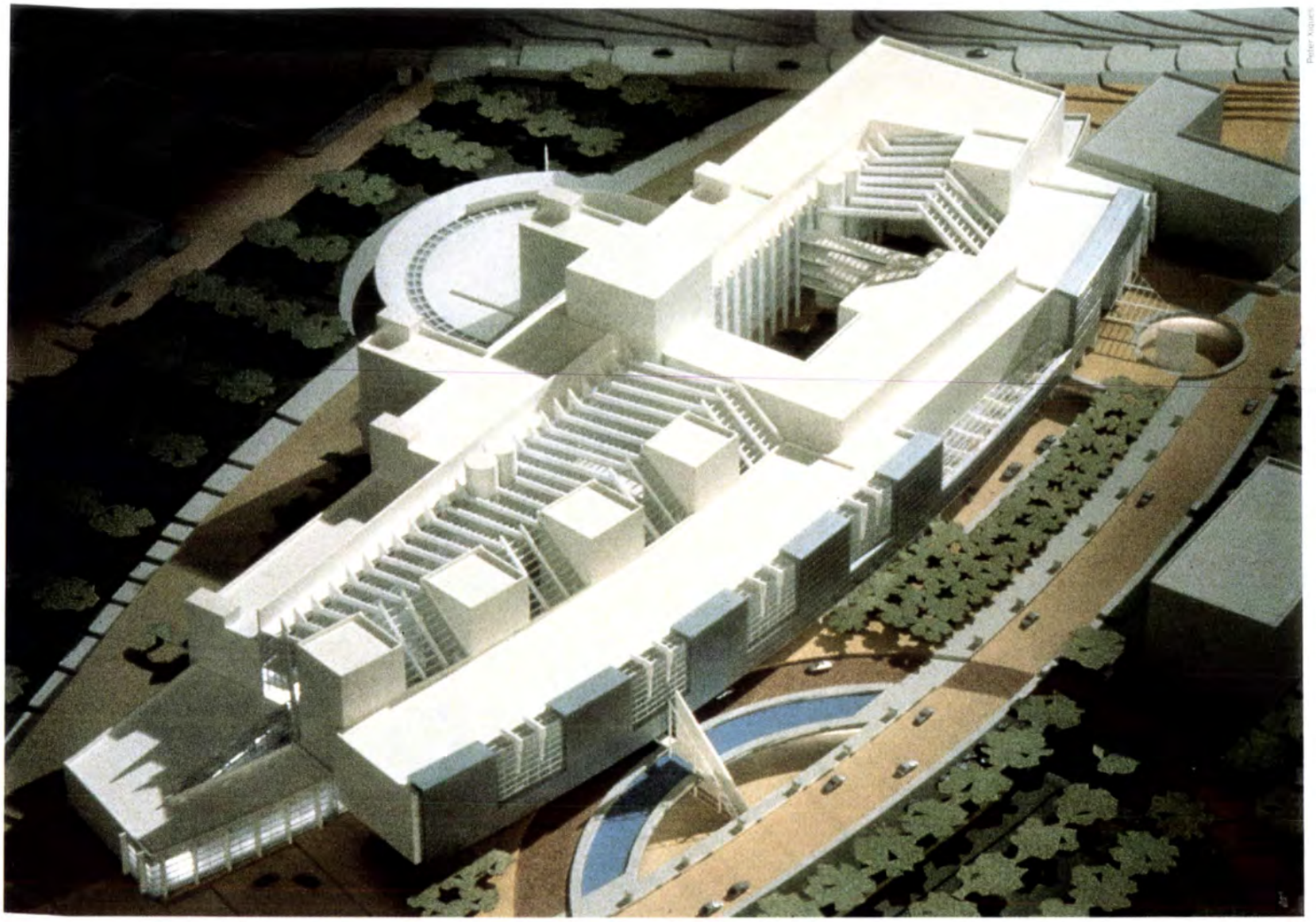


Plaza level



Second level

Third level



Peter Aaron

Above *Model view.* ***Below*** *Proposed first floor plan*

Sinai Hospital of Baltimore, Maryland 1993

The master plan for this 460-bed tertiary care centre includes 100-bed super-nursing units to facilitate patient-focused care. Also planned are a new ambulatory care centre, combining hospital-based clinics and private offices, a new atrium-based circulation system that facilitates wayfinding to all departments, the remodelling of existing facilities, and improvements to the campus road and parking system.

The plan emphasises clear site circulation with all public entrances accessed from a two level traffic and parking mall. Entrances are located conveniently for their respective reception points and clinical areas. Women and children's inpatient and outpatient services are reached from the upper level and emergency services are reached from dedicated circulation below. Service and staff entrances are located at the rear.

The master plan was completed in 1993 and the first phase, the Staff Services Department, has now been built.

Curtis Martin

Beatriz Coll

Above *View of the three-storey pavilion housing public meeting rooms and the main entrance.* ***Below*** *Full height entrance lobby links pavillion to main building*

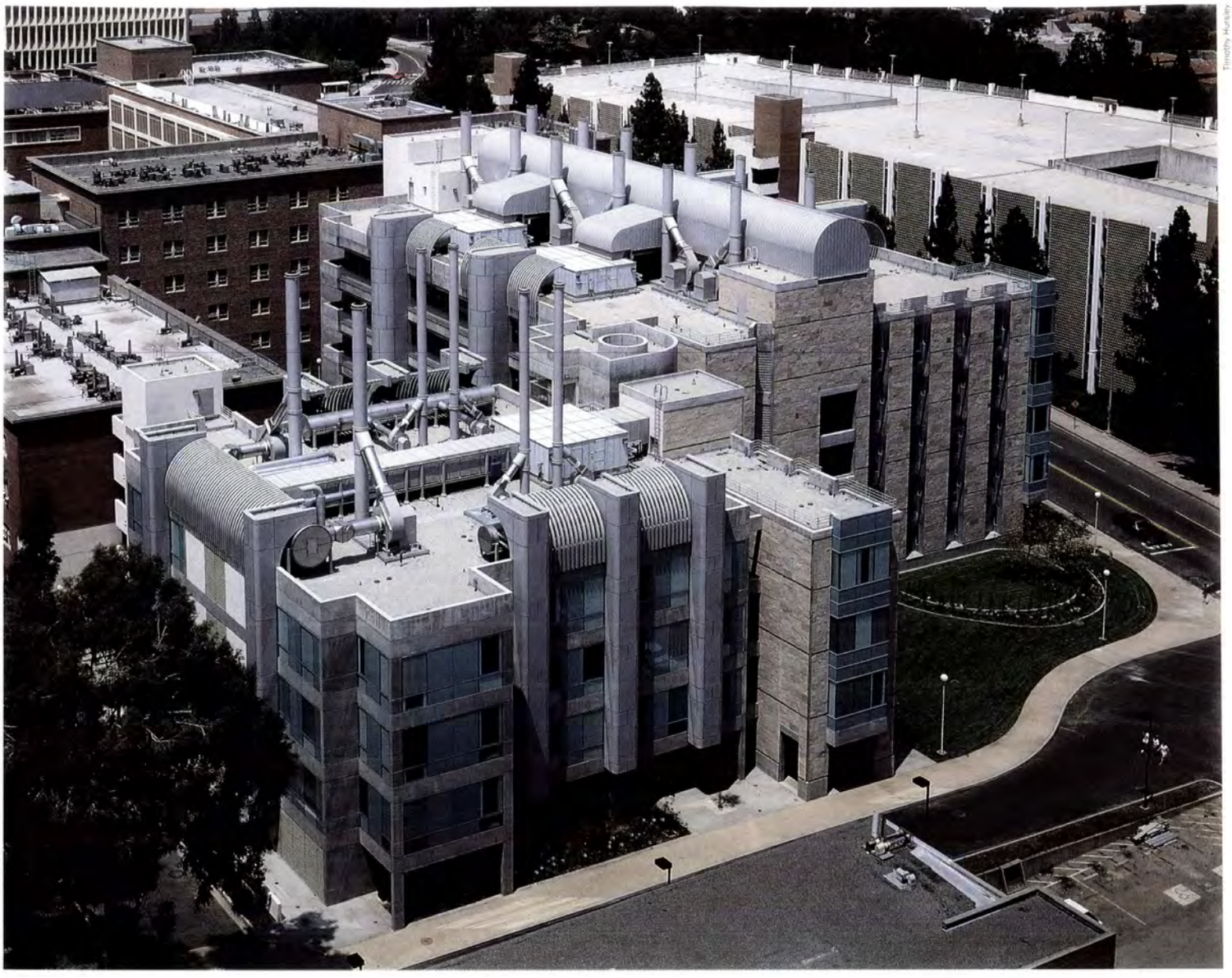
Tang Center, University of California, Berkeley 1993

Beatriz Coll

The Tang Center is an outpatient medical facility serving the students, faculty and staff of the university. The 75,000 square foot building accommodates 32 departments in eight service areas: Clinical Care, Clinical Support, Optometry, Health Promotion, Human Resources, Facility Support, Administration and Education/Meetings.

The site is on the edge of the campus in a transitional zone between large scale university buildings and a smaller scaled residential neighbourhood. A three-storey spine block, linking two parallel street frontages north-south across the site, accommodates offices and clinics in four modules linked by three service cores. On the west side of this block, a three-storey pavilion, square on plan, contains public meeting rooms. The pavilion is linked to the spine block by a full-height glazed atrium and entrance lobby. This arrangement creates two landscaped courts, one incorporating the carpark and the other preserving a small single-storey building of historic significance which will eventually house a health reference library.

The facades of both the pavilion and the spine block have a classical tripartite division – base, shaft and top – emphasised by the solid corner piers, the bracketed overhanging eaves and the open terraces at the corners on the top floor. The building nevertheless has an approachable, non-institutional character. Its spreading roofs, welcoming lobby, expressive forms, multiple access points, repetitive modules and indoor/outdoor flow all combine to recall the Bay Region architecture of the early years of this century, in particular the work of Bernard Maybeck who designed many houses in Berkeley.



Timothy Hursley

Molecular Sciences Building, Center for Molecular Science, University of California, Los Angeles 1993

This 159,000 square foot, US$38.5 million building adjoins the existing Young Hall and is divided into two wings housing research functions for the departments of chemistry and microbiology. Challenged by the complexity of the building services required for this densely programmed laboratory, the Anshen + Allen team organised the programme, structure, and services into a highly integrated and sculptural building. Service modules are aligned with the ventilation system's machinery and distribution, inside and out. The concrete structure accommodates the building services in a system of vertical shafts and deep ribbed slabs. The building is very efficient because every element serves multiple functions. Laboratory facades are glazed between metal clad air shafts, while the office facades are clad in sandstone.

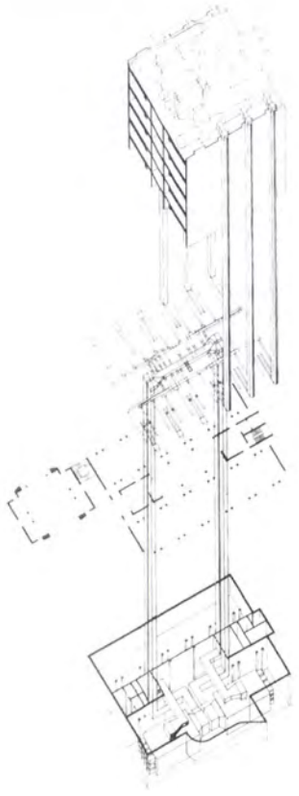
Ground floor plan

all photos this page Timothy Hursley

Opposite page *Aerial view indicates the complexity of the building services.* ***Top left and left*** *Sandstone clad office facades.* ***Top right*** *Laboratory facades are of exposed concrete and glass between metal clad air shafts.* ***Above*** *Open concrete stairwell acts as a "hinge" between the two blocks*

Tom Bonner

Above *The laboratory is designed to harmonise with existing buildings.* ***Right*** *Diagramatic view of the building's mechanical plant*



Agricultural Research Laboratory Building, University of Arizona, Tucson 1992

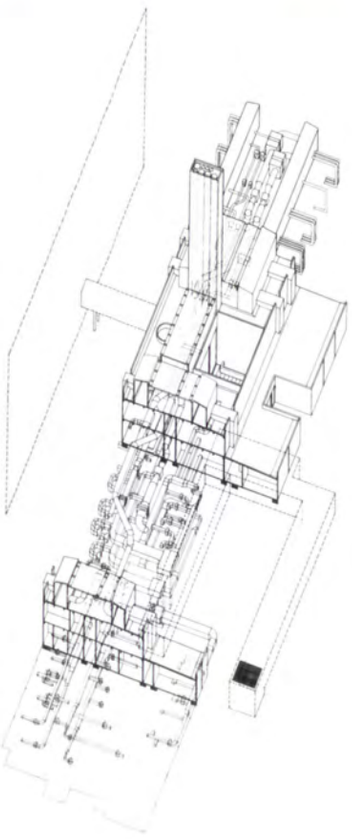
This 122,686 square foot building houses research and teaching laboratories, and offices for the Departments of Plant Pathology, Plant Sciences and Entomology, plus new programmes in Biotechnology. In addition to these, there are also facilities for tissue culture, electron microscopy, nuclear magnetic resonance, and spectroscopy. The mission of students and faculty is to undertake instruction and research in support of the College of Agriculture.

The building is designed to be in harmony with the surrounding buildings on the campus, particularly the Forbes Building (built in 1915) and the Shantz Building (built in 1962). A pedestrian corridor bridge links the Forbes Building to the new facility.

Construction staging was a particularly challenging aspect of the project. The surrounding facilities remained operational throughout the construction period and access to them had to be maintained.

Timothy Hursley

Above *New facility with 100-foot chimney.* ***Left*** *Diagram of ducting for toxic chemical exhaust*



Joint Science Teaching and Research Facility, California State University, Fullerton 1992

This new science centre resulted from a study which determined that floor-to-floor heights in the existing science facility (McCarthy Hall) could not accommodate the fume hood duct work required to control toxic chemical exhaust. Wet labs for geology, biology, chemistry, and physics have been relocated to the new science addition, while faculty offices and non-fume generating labs remain in McCarthy Hall. Old and new buildings are connected by a second-level bridge.

The new building contains undergraduate teaching labs for all disciplines on the second level. Labs requiring a higher level of security and safety due to chemical use (by upper division/graduate students and faculty) are segregated on the ground floor, with separate service access. A 100-foot chimney discharges fume hood effluent into the atmosphere. Chemical scrubbers and carbon filters ensure that the exhaust air is clean before it leaves the stack.

David Hewitt/Anne Garrison

Above *Natural materials respond to colours of the surrounding countryside.*
Right *Angled canopies shade walkways*

David Hewitt/Anne Garrison

Campus Services Complex, University of California, San Diego 1992

The US$13 million Campus Services Complex is a 110,000 square foot office and industrial facility housing the Campus Mail Service, Telecommunications, Graphics and Reproduction, Physical Plan Services, Campus Security, Vehicle Maintenance, and a materials handling facility. Situated on a long narrow site of 17.5 acres, the complex is composed of four one-storey office buildings and a series of two-storey warehouse buildings. The office buildings, which face the interior of the campus, are separated by courts and linked to the adjacent warehouse spaces by an external pedestrian walkway.

The walkway is shaded by angled canopies which visually link the building elements and act as a screen for the high bay industrial buildings. The stepped massing of the buildings and the use of natural materials respond to the contours and colours of the surrounding landscape.

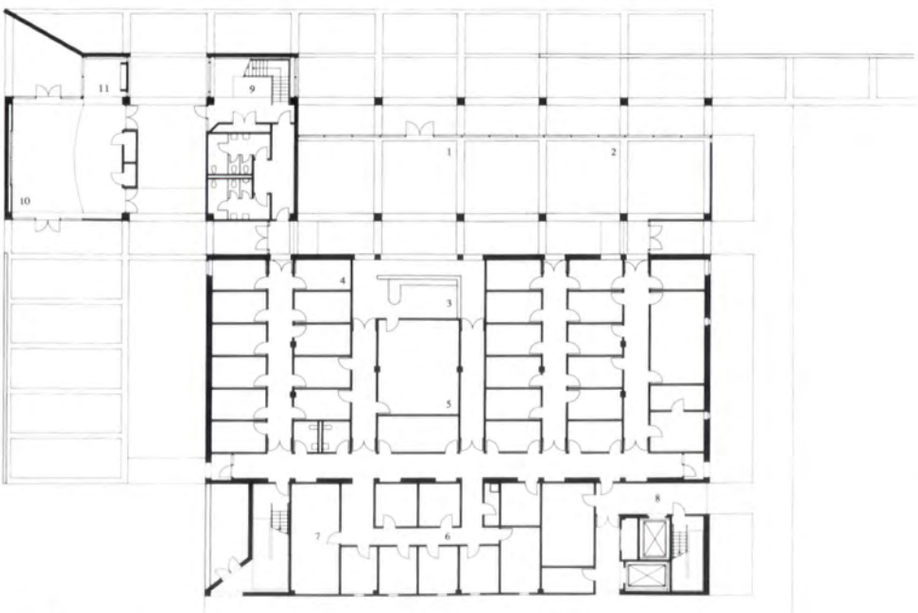
Below left *External view of the two new wings which are linked by a skylit gallery* ***below***

Mark Darley

Mark Darley

Ground floor – Key

1. Faculty office
2. Secretary
3. Director
4. Laboratory
5. Lab support
6. Elevator lobby
7. Open to below



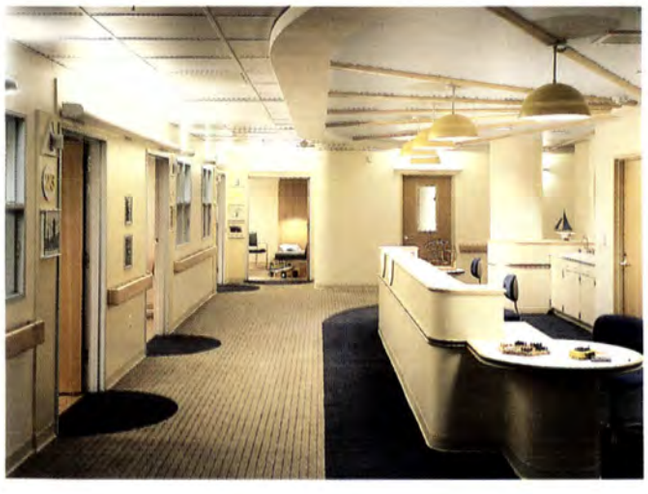
Ground floor plan

Shiley Eye Center, University of California, San Diego, La Jolla 1991

The design of this eye research centre aims to bring together the various functions of the university's Department of Ophthalmology while maintaining the independence of each part. The site was chosen for its close proximity to other clinical and research support facilities and conforms to the UCSD Long Range Development Concept Plan. The building responds to its corner site and relates in its exterior colour and materials to the University's proposed satellite medical facility.

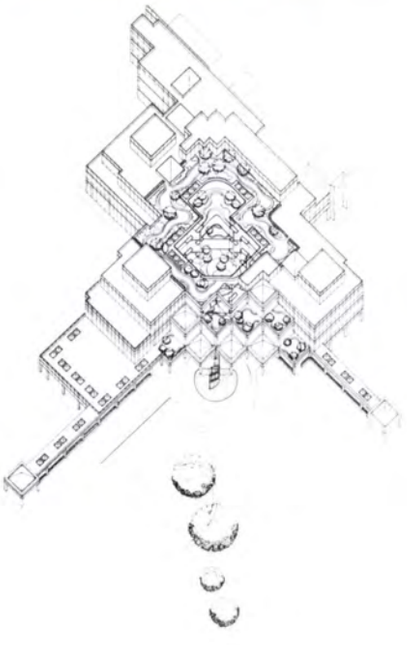
The three-storey wing of the 36,395 square foot building accommodates a clinic, including waiting areas and a conference/library on the ground floor; research, administration and faculty offices on the first floor; and surgeries on the second floor. The two-storey north wing, which accommodates non-technical functions, is articulated as a separate building with a vaulted roof and is joined to the three-storey wing by a skylit gallery.

Jane Lidz



Chas McGrath

Above *Materials and form relate to existing buildings.* ***Left*** *Nursing station*



Lucile Salter Packard Children's Hospital at Stanford, Palo Alto, California 1991

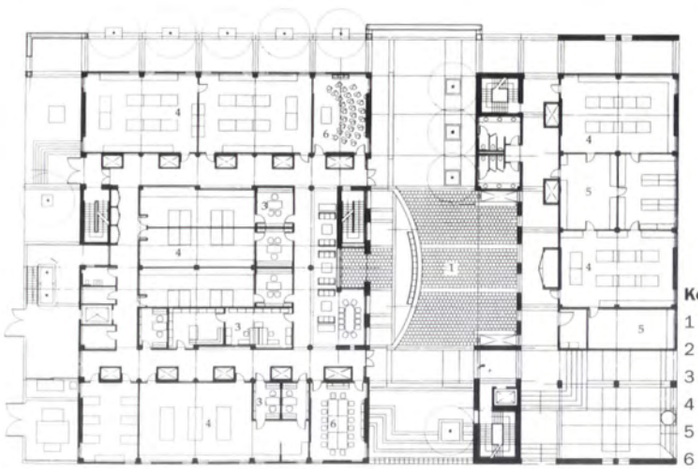
This 125-bed hospital provides a full range of specialised paediatric services to the Bay Area community. It is also the teaching hospital for the Department of Paediatrics of Stanford University Medical School and is fully integrated into the Stanford University Medical Center. In addition to the diagnostic, treatment, support and administrative areas, a major component is an ambulatory care centre serving 30,000 outpatient visits per year. The ambulatory care centre is composed of six modules: primary care, haematology/oncology, orthopaedics, allergy/pulmonary, miscellaneous sub-specialties and an HMO/PPO group. It also includes an eight-bed day hospital.

Inpatient facilities include 50 medical/surgical acute care beds in three age-based nursing units, a 10-bed psychosomatic unit, a 14-bed compromised host unit, 20 paediatric intensive care beds and 31 neonatal intensive care isolettes, as well as complete parent and family support facilities and teaching spaces. The hospital's labour and delivery department is adjacent to the well-baby nursery and postpartum beds in Stanford Hospital, forming the core of the university's paediatric perinatal service.

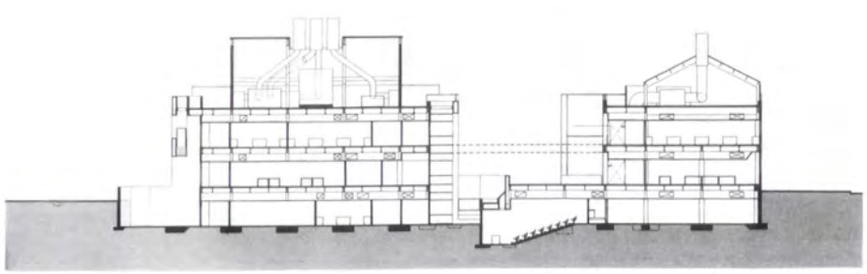
Anshen + Allen began the design process with an intensive one year programming and master planning effort, including a series of interactive workshops with the client. The resulting master site and facility plan placed the new structure at 90 degrees to the approach to Stanford University Medical Center. This rotation provides the Children's Hospital with a separate and distinct entrance.

Jane Lidz

Central courtyard separating the two wings of the building



Ground floor plan



East-west section

WM Keck Foundation Joint Science Center, The Claremont Colleges, Claremont, California 1991

This building, completed in December 1991, is sited between Claremont McKenna, Pitzer and Scripps Colleges on the Claremont campus and accommodates those colleges' joint science department. Entries from three directions converge in a central courtyard that separates the two wings of the building. The east wing houses chemistry, biology and physics teaching laboratories. In the basement, natural science classrooms and a lecture room are open to lower courtyards that function as outdoor classrooms. The west wing contains chemistry and biology research laboratories, as well as advanced teaching labs.

All faculty offices are directly adjacent to both research labs and a central lobby in order to promote the student/faculty interaction. The lobby on the first floor opens directly to the courtyard. Support facilities, including dark rooms, workshops, and animal holding facilities, are located in the basement. Construction cost for the project was US$11,400,000.

Award winning courtyard scheme providing pleasant views and privacy for residents

Robert Creamer

Luxury Town Houses, Mount Vernon Mews, Baltimore, Maryland 1988

The site for these luxury town houses was a difficult one. Though only four blocks from the elegant Mount Vernon Square it looked eastward to the Jones Falls Expressway and a state prison beyond. On its western boundary was Hunter Alley, an access road to the back stairways and trash cans of row houses in Calven Street. There was also a ten foot fall west to east.

The architects' solution was to build two rows of houses running north-south on either side of a private courtyard. The front walls maximise the views onto the tree-lined courtyard, and the back walls, with only the minimum of windows, block the unpleasant views and noise of the surroundings. The bowed facade form of the houses was borrowed from the architecture of Charles Village, angling slightly southward for greater privacy and better views of the courtyard. Each unit has a walled garden at the front, raised above the courtyard walkway and enclosed by a low brick wall with iron fencing.

This project was completed in 1988 by Hord Coplan Macht prior to its merger with Anshen + Allen. It won design awards from the Baltimore Chapter of the AIA and the Maryland Society of the AIA.

Below left *View of the southern elevation of the hospital which has been described as an ingenious amalgamation of shopping mall, resort hotel and highly serviced shed.*
Below *Ground floor plan*

Jaime Ludz

Clovis Community Hospital
Clovis, California 1988

Anshen + Allen developed a master plan for the replacement and expansion of Clovis Community Hospital on a new 140-acre site. The plan envisages a medical campus that will eventually contain a 360-bed hospital, outpatient facilities, medical office buildings, housing for the elderly, a skilled nursing facility, chemical dependency units, mental health units and a hospice. The plan includes a land reserve to accommodate long-term flexibility and to respond to the evolving needs of this fast-growing region of California.

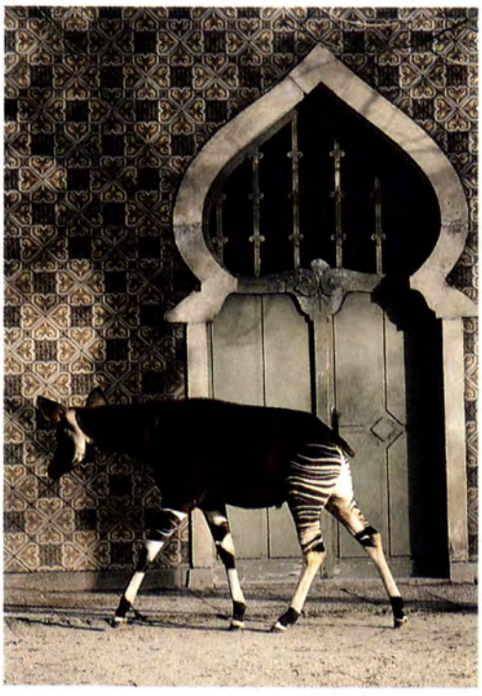
The first phase of implementation of the master plan was completed in 1988 with the opening of a 120-bed hospital. Anshen + Allen provided programming, planning, architectural and interior design services for the project. The Hospital is organised as a medical mall in which individual medical buildings are linked by a circulation spine that facilitates future growth. The project was designed to be constantly evolving.

The air conditioning system uses low cost energy at night to make ice, which is then used to cool the building during the hot part of the day when energy costs are high. The energy efficiency of the hospital helps to reduce the soaring costs of diagnosis and treatment. The building has been described as an ingenious reinterpretation and amalgamation of twentieth-century typologies – the shopping mall, the resort hotel and the highly serviced shed.

Gallery

Nicholas Kane
Citizens Advice Bureau
Chessington, UK
Bramante Architects

Richard Bryant
Chalet
Humberston Fitties
Cleethorpes, Lincolnshire, UK



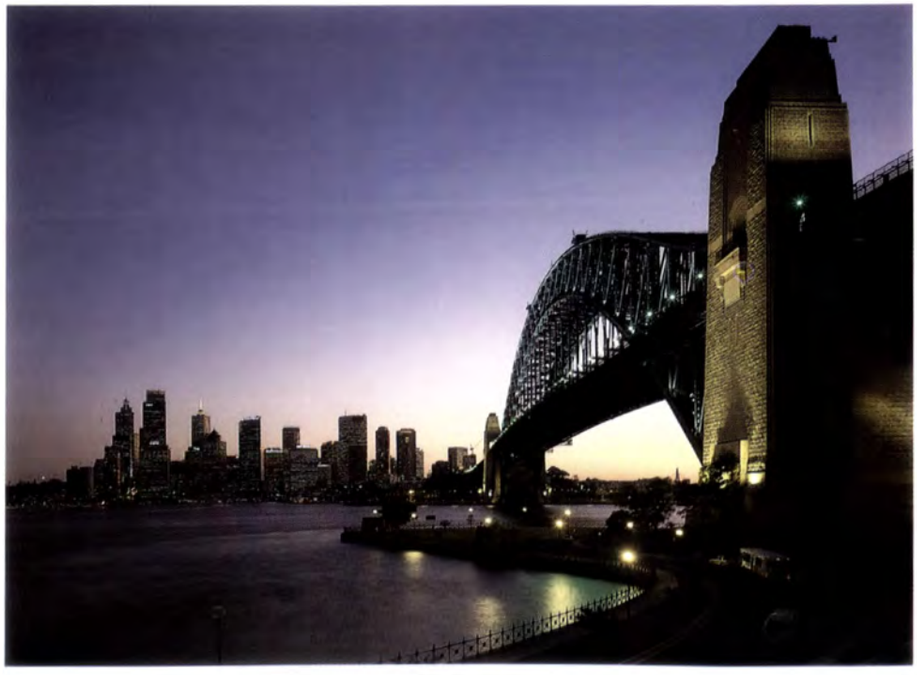
Mark Fiennes
Antwerp Zoo
Belgium

Dennis Gilbert
Housing – London Docklands, UK
Architects: BDP

Bill Tingey
Roof detail, Heian Jingu Garden,
Kyoto, Japan

Jeremy Cockayne
Collector's House, Antwerp, Belgium

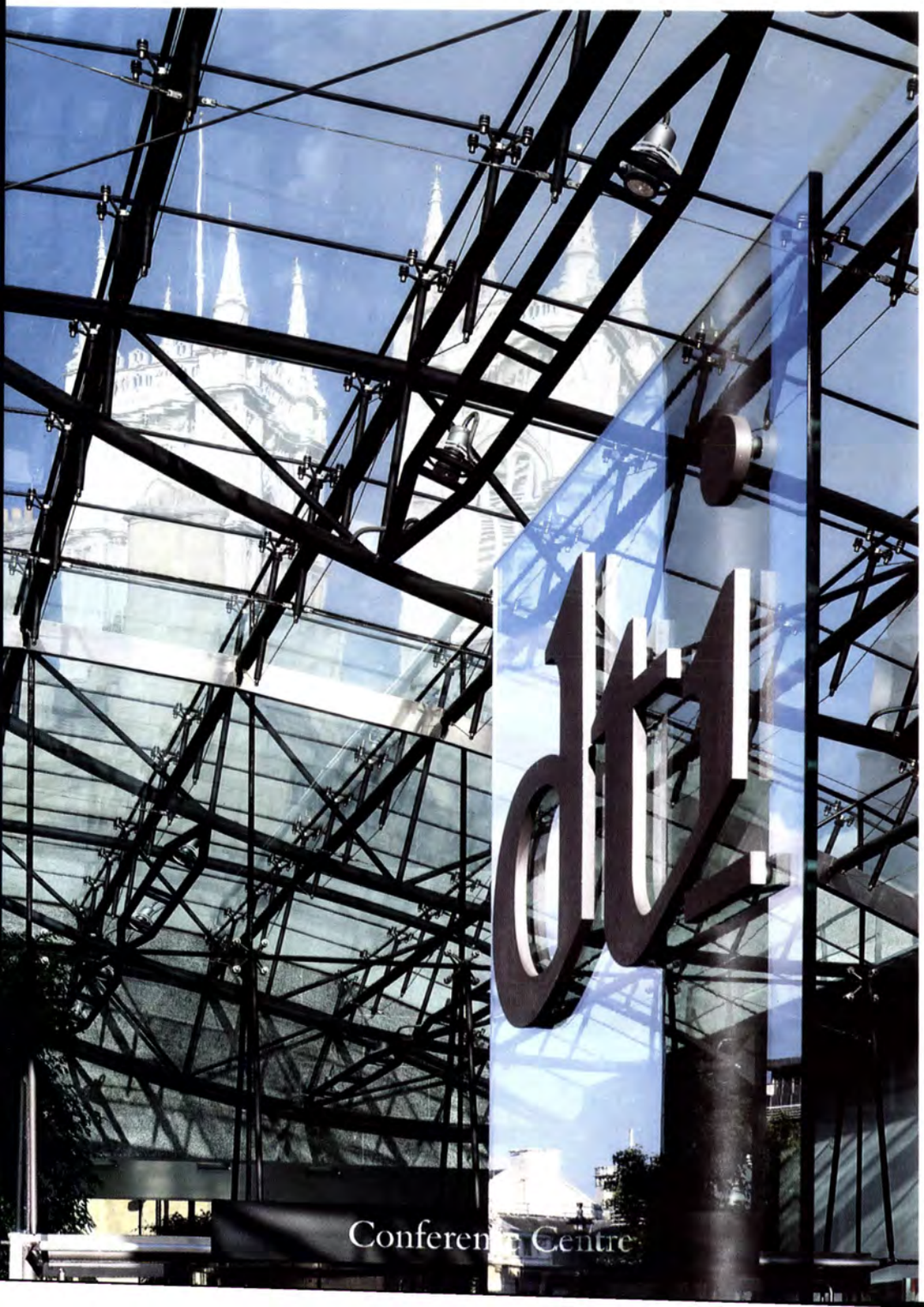
Alan Williams
Bridge, Sydney, Australia



Simon Kenny/Belle
Waterside House
Pitwater, Sydney, Australia

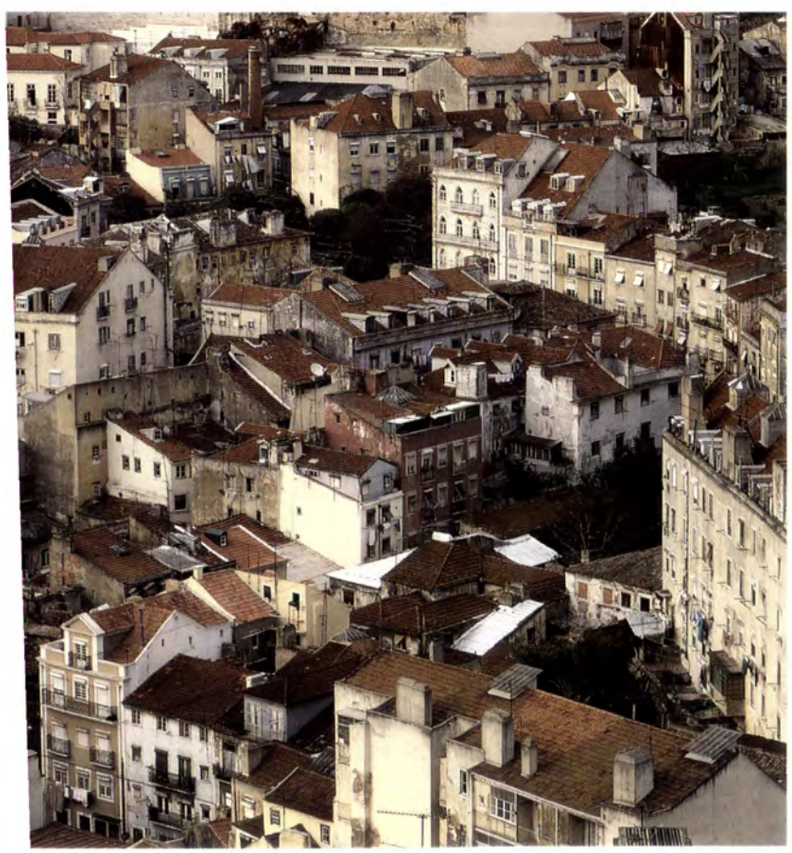
Nic Barlow
Indian Temple
Schloss Schönbrunn,
Vienna, Austria

Richard Bryant
Department of Trade and Industry (DTI)
London, UK
Architects: DEGW



Farrell Grehan
Copacobana
Rio de Janeiro, Brazil
Landscape architect: Roberto Burle Marx

Richard Bryant
Private Residence
London, UK
Architect: Seth Stein



Richard Waite
Lisbon, Anjos District
Portugal

Richard Glover
Jigsaw
New Bond Street, London, UK
Architect: John Pawson

Project Review

Wood Residence, New Custom Home, Laguna Beach, California

Architects Horst Architect

A fire at Laguna Beach in California in the autumn of 1993 destroyed over 300 residences. The cerendipitous meeting between one of the Laguna Beach residents, whose home had been burned down, and Horst and Arianna Horst Architects led to the commission. With the insurance money, they have commissioned a new custom-made house to the same dimensions of the original 9,000 square foot property.

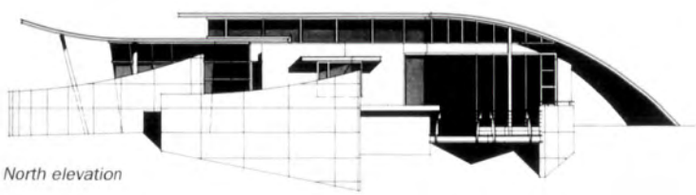
Drawing on the work of Frank Lloyd Wright, RM Schindler and Richard Neutra in this region of California, Horst Architects' design concept focused on the idea of a light, non-solid/ephemeral structure composed of planes, some of them curved, that hover above to echo the shapes of the surrounding hills. As illustrated in the isonometric plan, these planes also intersect and float above the glass openings, describing flowing movements of elements interrupted in space.

Two curved concrete walls define the spatial boundaries of the site and provide privacy. Behind these walls there is an east facing entrance courtyard. This is linked to the interior by a passage which appears as a fissure occuring at the intersection of the primary roof planes. The roof plane above the dining room, at the entrance courtyard, curves upward and is supported by three steel columns. To emphasise the dynamic, one of these columns responds to the upward curve of the roof by angling outward.

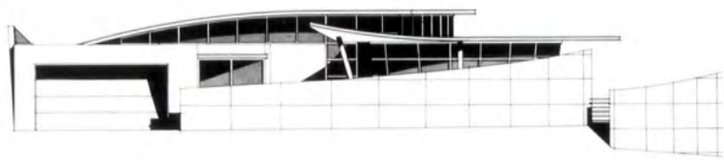
The family room deck is located at the northern end of the two concrete walls and floats above the site, extending the interior space of the residence toward the Laguna Canyon to the north.

The exterior is of concrete cast on site which, in specific areas, is finished with mahogany and copper. These were chosen for their enduring characteristics and their implicit relationship to the natural landscape. The interior composition is organised as a procession from public to private space along an interior passage. This passage begins with the family spaces at the entrance and narrows in width at the opposite, bedroom end. Windows at the intersections of the planes allow natural light to flood in. **WA**

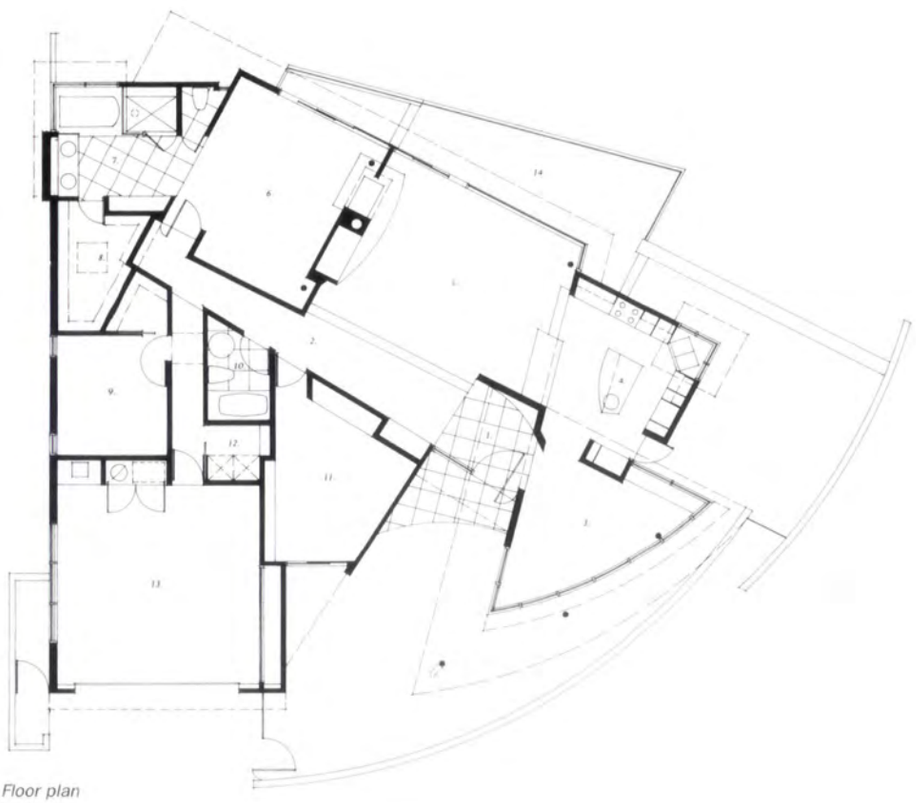
Opposite page top *Composed of planes, some of them curved, the hovering forms of the Wood Residence seek to echo the shapes of the surrounding hills.* ***Opposite page below*** *The intersecting planes float above the glass openings. They are constructed of copper, due to the material's implicit relationship with the natural landscape.* ***Images on this page, clockwise from above*** *The interior layout is organised as a procession from public to private spaces along an interior passage; windows at the intersections allow natural light to flood in. View of interior passage. The passage begins with family spaces at the entrance and narrows in width at the bottom end, where the bedrooms are located*



North elevation



South elevation



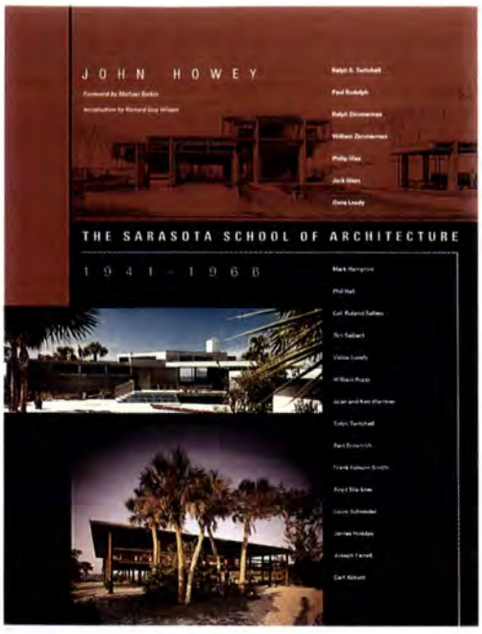
Floor plan

Floor plan – Key

1 Entrance
2 Passage
3 Dining
4 Kitchen
5 Family room
6 Master bedroom
7 Master bathroom
8 Closet
9 Child's bedroom
10 Bathroom
11 Library
12 Laundry
13 Garage
14 Terrace

Architect	Horst Architect
Client	Doug and Rebecca Wood
Design Team	Horst R. Horst, Arianna Horst, Ruben Suare
Computer Modeling	Ruben Suare
Model Photography	Horst R. Horst, Arianna Horst, Ruben Suare
Structural Engineer	Rozack Engineers
General Contractor	David A. Scholar and Assocaites
Photography	Exterior: Don Bonsey. Interior: Chris Bliss

Books



WHY SARASOTA?

The Sarasota School of Architecture 1941-1966. *John Howey. MIT Press. 200pp. US$35 (hardback)*

Reviewed by Kelly Shannon

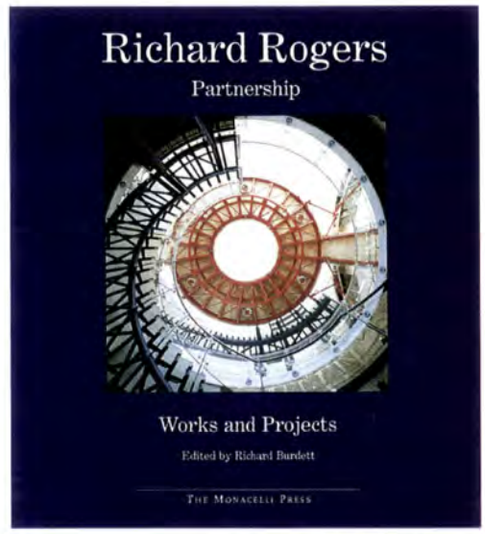
Ever since Ponce de Leon's discovery of the "Feast of Flowers" (Florida) the relatively flat, temperate climate of the east coast "Sunshine State" has been a utopian haven for tourism and retirement industries. Disneyworld, the primordial Everglades, the rockets of Cape Canaveral and the natural beauty of the Keys mark Florida as an eternal dream site. Sarasota, a city located midway down the tropical peninsula on the Gulf of Mexico, exemplifies the post-World War II, nouveau-rich grandeur of the American middle class with its "quick-buck speculation" and embracing of suburbia. *The Sarasota School of Architecture 1941-1966* is the first comprehensive research into the architectural backwater of Sarasota, Florida, where the liberal progressivism of architects and clients combined to create one of the finest moments of high American modernism. John Howey's documentation of a missing chapter to the history of modernism in the US is profusely illustrated with architects' drawings, including Paul Rudolph's exquisite pen-and-ink renderings, and photographs from the rich photographic archives of Ezra Stoller, Alexandra Georges and others, whose images, primarily of houses of the 1950s and 1960s captured the imagination of the international architectural community.

In 1941, Ralph Twitchell, the acknowledged father of the school, and Paul Rudolph, the school's "spiritual leader", formed a partnership that produced bold architectural works and theories based upon a respect for local materials, construction practices and lifestyles, coupled with experiments involving new materials and structural evolution. The "Sarasota School" was formed by the "GI generation", primarily following the thesis set by Twitchell and Rudolph, which initially embraced modernism and later tried to break the orthodox stronghold with various experiments in roof forms, fenstration and selective contextual abstraction. Among the prominent group members were: Mark Hampton, Gene Leedy, Jack West and the separate genius of Victor Lundy. In eight clearly organised chapters, Howey traces the early influences on the Sarasota group, including the architectural oeuvre of Frank Lloyd Wright, the "Fantasy-land in Utopia" mentality of entrepreneurial Floridians, and overwhelming optimism for the future. Later chapters work around pivotal events illustrating the effect of World War II on the Sarasota architects; the early post-war successes of Twitchell and Rudolph; the recognition of the Sarasota legacy and its relations to the Bauhaus and International Style; the 1960s new directions of individual architects and decline of "the school"; and eventually a final chapter, "Beyond Sarasota".

The critical perspective Howey injects into the last chapters deals with the 1960s intellectual and philosophical revolt against modern American architecture in an unfortunately superficial manner. Grand, sweeping statements are not adequately qualified and new observations are left unsaid. His nostalgia for the "Heroic Era" of architecture undermines his criticism of the present architectural climate in the US. By not addressing the American separation of style and ideology with the modern movement, he does not recognise that even the Sarasota school, although masked with a "modern" style, was devoid of the ideological/social premises which modernism carried in Europe.

Richard Guy Wilson, in the introduction, admits "it is unfortunately too true that many of the houses of the Sarasota school were second homes...and the clientele for them was limited". Wilson also questions the grouping of the Sarasota architects into a "school", since a common vision is not always so apparent, other than the emphasis of tectonics over economics. In his foreword, Michael Sorkin states, "one of the greatest fascinations of paradise is the fall from it. Why did Sarasota end?" His own blunt answer that, "as the 1960s progressed, America lost the confident lightness of functionalism as it careered into a fresh baroque of stupid prosperity... the locals became less hospitable, the spirit of the strip sapped the spirit of the place", best summarises the impossibilities of the "modern project" in the American cultural context.

A LEGEND IN HIS OWN LIFETIME



Richard Rogers Partnership: works and projects. *Richard Burdett editor. Essays by Richard Rogers, Richard Burdett and Peter Cook. The Monacelli Press. 276pp. £35 (paperback)*

Reviewed by Martin Pawley

It goes without saying that Sir Richard Rogers is a saint. He believes in miracles, like the resurrection of cities, the coexistence of art and nature, the healing power of technology, and anything else that right-thinking people want to believe that the Millennium might bring. As a result of the bundle of beliefs that he carries round with him he is also a man who embodies many contradictions. He can do this too.

As he observes in his preface to this volume, not only cities but whole civilisations can be redeemed. For him the lost civilisations of Easter Island and the Indus Valley are the disastrous urbanism of Hackney and the Bronx writ large – disaster areas that only require the throwing of an architectural switch to bring light to their underlying similarity to the Galeria in Milan, or the Ramblas in Barcelona. In short, Sir Richard Rogers lives in a world where everything is possible.

For most people, all too conscious of living in a world where everything is not possible, this must seem a risible notion. Indeed it would be if Richard Rogers were no more than a charismatic politician, whose talk could be dismissed as a smoke screen, the kind of nonsense that all politicians talk. But Sir Richard Rogers is more than a politician. The days when his name was confused with the composer of *South Pacific* are long past. Today the Richard Rogers Partnership is a powerful organisation in the world of planning, design and construction, possessed of international reputation and global reach. If someone paid it to, it really could convert Hackney into the Ramblas, or Mexico City into Milton Keynes. We know this because any compilation of RRP's work (like the excellent collection assembled in this pleasantly tactile and almost portable volume), is impressive enough to make the most determined cynic doubt his or her disbelief.

There is nothing superficial about the Richard Rogers Partnership. As Richard Burdett notes in his introduction to the book, even the firm's offices are "a living example of the practice's belief in the regenerative and social potential of architecture". It is this seamless, 24-hour-a-day join between world and world-view that underpins the tremendous success of the Richard Rogers Partnership in the era of world architecture. Over the last quarter century the firm has worked in places as far apart as Beijing and Berlin, Princeton, New Jersey, and the Czech Republic. And over that period, forced on by the ordeal of a punishing schedule of public appearances, Rogers has converted himself from a confused but well-meaning thinker and a stumbling public speaker, into one of the most important architectural theorists and environmental spokesmen of our time.

Richard Rogers Partnership: works and projects offers modest doses of all the elements of the Rogers phenomenon. We have Rogers the urban theorist; Rogers as seen by Richard Burdett (in a racy appreciation of his work that incorrectly attributes him to Alex Gordon's 1970s slogan "Long life, Loose fit, Low energy"), and a heavier dose of illustrated projects. It is these last that make up the bulk of the volume, and their treatment that must command the greatest respect, for it should be noted that the project descriptions – often the scrappiest, most uninformed element in any architectural picture book – are in this case readable, informative and fitting companions to the complexity and ingenuity of the work they describe.

Erich Kettelhut's "Dawn", from Metropolis

SCENE, BUT NOT HEARD

Film Architecture, Set Designs from Metropolis to Blade Runner. *Edited by Dietich Newman. Prestel 207 pp. £39.95 (hardback)*

Reviewed by David Bass

Considering the major ingredients of masochistic jealousy and consolatory escapism underlying architects' typical obsession with movies, its seems odd that so few books try to explain or pander to such an enthusiasm. Instead, there is an accepted canon of "architectural" cult movies, and a word-of-mouth network of hot tips for architectural jollies in film. Those architects who delve deeper are usually rebuffed by the indigestible rose of "cultural studies" or left aghast at film critics' attempts to "do"architecture.

Newumann's book is a handsome and valuable contribution to this inexplicably neglected field. Its mention of *Metroplolis* and *Blade Runner* alerts the reader to cult content, but it is no drooling fanzine. It contains five intelligent introductory essays, well illustrated discussions of 24 movies – not all of which are well known – a fascinating collection of writings on film and architecture from the Weimar Republic, biographies and an extremely thorough bibliography. All very helpful, but despite that compendious title, *Film Architecture* is not a reference book. Instead, it picks a few areas of interest: thirties America, Jacques Tati's technological tragicomedies, recent retro-futuristic Hollywood products and twenties Germany. For this latter period, when in the absence of soundtrack dialogue set design rose to the task of providing a kind of psychological underscoring to the action, the reader is particularly well served.

But the title's middle clause (missing from the front cover) indicates the book's main stumbling block: "set design". This puts us distinctly in the realm of the glamorous, rather than the strictly architectural. Unfettered by planning constraints, client demands or other occasionally baleful influences, the sense that someone else – the set designer – is having all the fun, is what fuels the architect's professional envy. "I translated images of architecture, not architecture itself, into set designs" avows *Batman's* production designer Anton Furst. Neither completely architectural nor – despite Neumann's claims to the contrary – simply mimicking the avant-garde, set design is instead a game of appearances which must look right for their one moment of glory.

In discussing set design, rather than the use or critique of existing buildings and cities in film, the book is oblivious to the profound insights of legions of directors, from Antonioni to Ozu to Satyajit Ray (or indeed that of their respective national cinemas), into the architecure of everyday life.

Perhaps the most interesting contribution of film to architecture is how film creates a kind of synthetic "space" by the accumulation of fragmentary images over time. While most of the book's essays speak of direct alignments between architecture made for films and their contemporary social settings, only Anthony Vidler discusses this latent spatiality in his essay previously published in the journal *Assemblages*. This, rather than how menacing or stylish its sets look, is film's biggest provocation to architects. **WA**

Transport

Toshiharu Kitajima

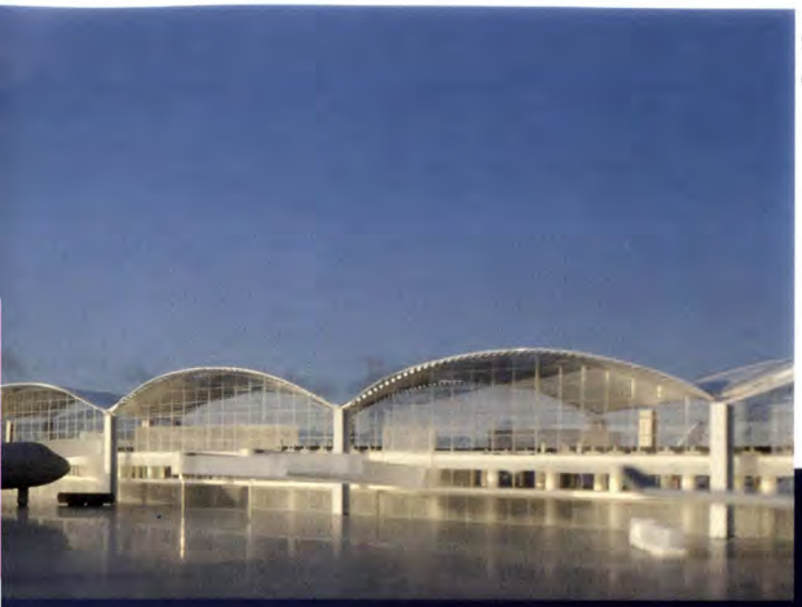
Left and below *Renzo Piano's Kansai Airport which takes the endless-section airport terminal form to a graceful conclusion.* ***Above*** *Model of Norman Foster's Chek Lap Kok airport in Hong Kong, currently under construction*

Trains and boats and planes

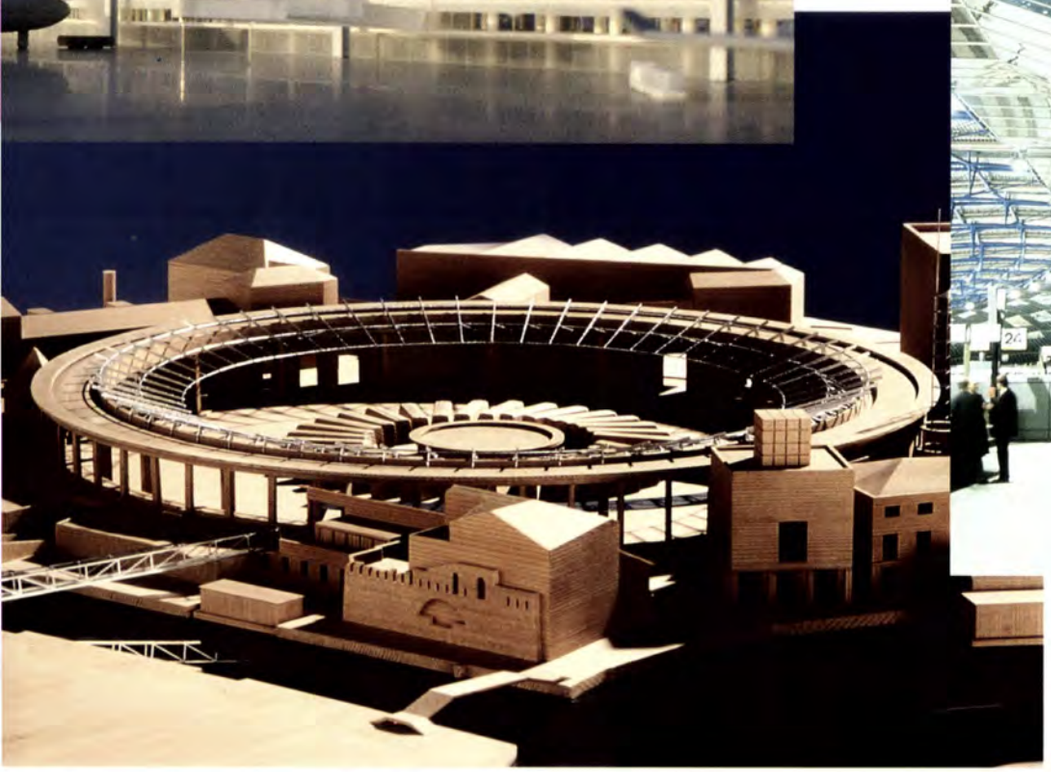
Hugh Pearman reports on the diversity of transport terminals around the world, from ferry terminals and bus stations, to giant international airports. As the world continues to get smaller, and infrastructure takes priority on the architectural agendas of newly emerging global centres, there are no end of commissions for architecture's megastars such as Renzo Piano, Norman Foster, Santiago Calatrava and Richard Rogers, as well as the huge specialist transportation firms. But it is not just the finer points of transport that need to be considered. As one airport architect commented last year: "Does a shopping centre really need a runway attached?"

Transport architecture is, usually, a matter of architecture getting to grips with a new or rapidly evolving technology. In its early stages it borrows from older building uses: thus, mid to late nineteenth-century railway sheds owed much to late eighteenth- and early nineteenth-century botanical glasshouses, while airport buildings of the 1920s had plenty in common with the ways shipping companies handled passenger movements at the dockside.

In the case of the railways, their antecedents were thoroughly appropriate, large-span, daylight-admitting structures that could scarcely be improved upon. The link between the conservatory and the station remains to this day. Consider how Nicholas Grimshaw and the engineer Tony Hunt, having won world-wide plaudits for their curving, asymmetrical Eurostar terminal at London's Waterloo Station, have now evolved their design into the Eden Project, a series of huge linked botanical glasshouses (in fact using inflated ETFE foil panels rather than glass) to be coiled around



Richard Davies



George Stowell

Right *Model of "A Gateway for Venice", competition winning bus station for the Piazzale Roma, 1991, by Jeremy Dixon and Ed Jones – sadly unbuilt.* ***Above*** *Inside the Waterloo International Train Terminal in London by Nicholas Grimshaw and engineer Tony Hunt*

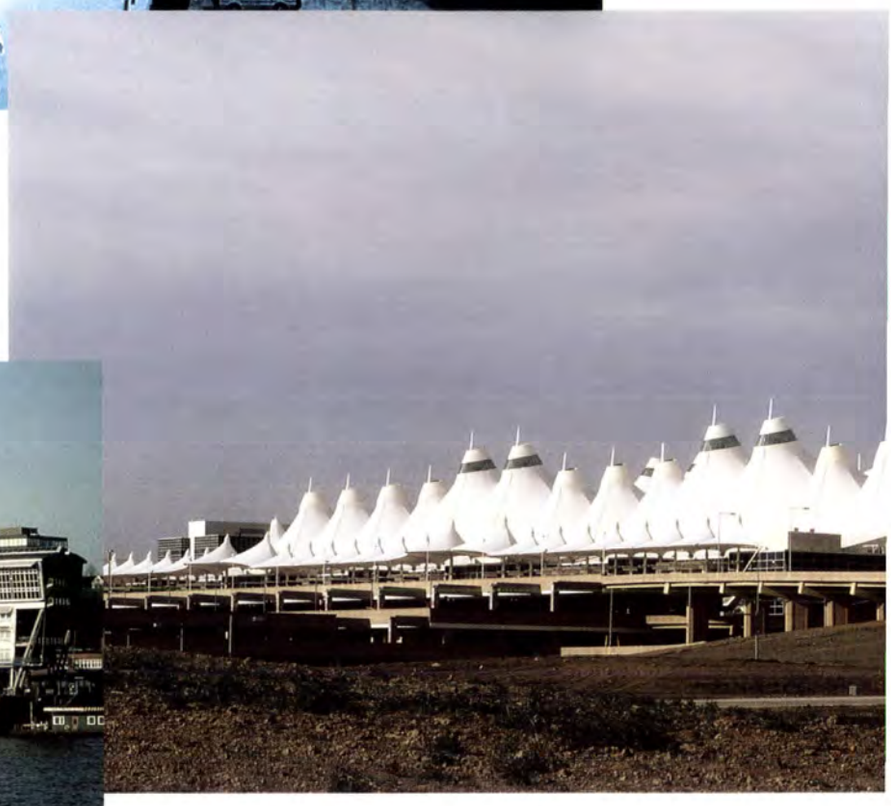
the cliffs of a defunct quarry in Cornwall.

While airships could use structures reminiscent of ocean liners – their hangars like inverted dry docks, raised above rather than cut into the ground – airports handling heavier-than-air craft needed to develop new forms to service numerous small vehicles rather than single large ones. The solution duly arrived in 1936 at Gatwick Airport south of London. The circular terminal building by architects Hoar, Marlow and Lovett not only had a circular control tower on top but was designed such that several planes could "dock" round its perimeter. Five radial corridors at ground level extended into telescopic tunnels running on tracks that took you under cover to your waiting plane: the prototypes of the now universal plug-in aerial walkways.

There is no essential difference between Gatwick in 1936 and any other airport based on satellite terminals, such as Charles de Gaulle at Roissy outside Paris. Yet this too proved inadequate, and so the all-in-one, end-less-section airport terminal developed, planes plugging into its length like pegs on a clothes line. Terminal Four at London's Heathrow by architects Scott, Brownrigg and Turner demonstrated the planning principles: at Kansai in Tokyo Bay Renzo Piano extruded the form much further and gave it architectural rigour and grace.

Is there, however, much space in reality for architecture, as opposed to engineering, in transport projects? It is in the nature of passenger terminals to be in a near-constant state of change. Big airports develop into small cities with little in the way of unifying elements. Planes change their characteristics: one moment buildings are designed with super-Jumbos in mind, the next an urgent need arises for short-hop commuter jets. On the seafront it is the same story: little changed for the past 30 years, dockside terminals now have to reinvent themselves to cope with either super-ferries or an entirely separate breed of vast catamaran. Hence the new terminals around the Irish Sea, many of them by Manser Associates, like Holyhead designed as a family of low-cost, curving profiled-metal buildings, have more in common with an airport than a traditional dock interchange, being designed for a very rapid turnaround of passengers and cars. In Oakland, California, architects Jordan Woodman Dobson have been equally ingenious in making the administration building of a prosaic container handling depot into a grand gateway to the site, skinned in crisp white panels reminiscent of Richard Meier.

The life of such buildings is only as long as the life of the machines they serve; even an architectural icon such as Eero Saarinen's 1959 TWA Terminal at Kennedy Airport is now surplus to requirements and under threat. Saarinen, at Kennedy and slightly later at Dulles, Washington, was not the first, but certainly the most influential, architect to use the metaphor of flight in his buildings – something that comes through at Norman Foster's Stansted (wing struts), Piano's Kansai (aerofoil section,



Clockwise from above *Computer image of Yokahama International Port Terminal in Japan currently being worked on by Foreign Office Architects; their proposal aims for a mediating device between the public spaces in Yokohama and the organisation of cruise passenger flow. The largest airport in the US, Denver International Airport, by CW Fentress, JH Bradburn and Associates, PC. Alsop and Störmer's DFDS canted double-decker ferry terminal in Hamburg*

Roderick Coyne

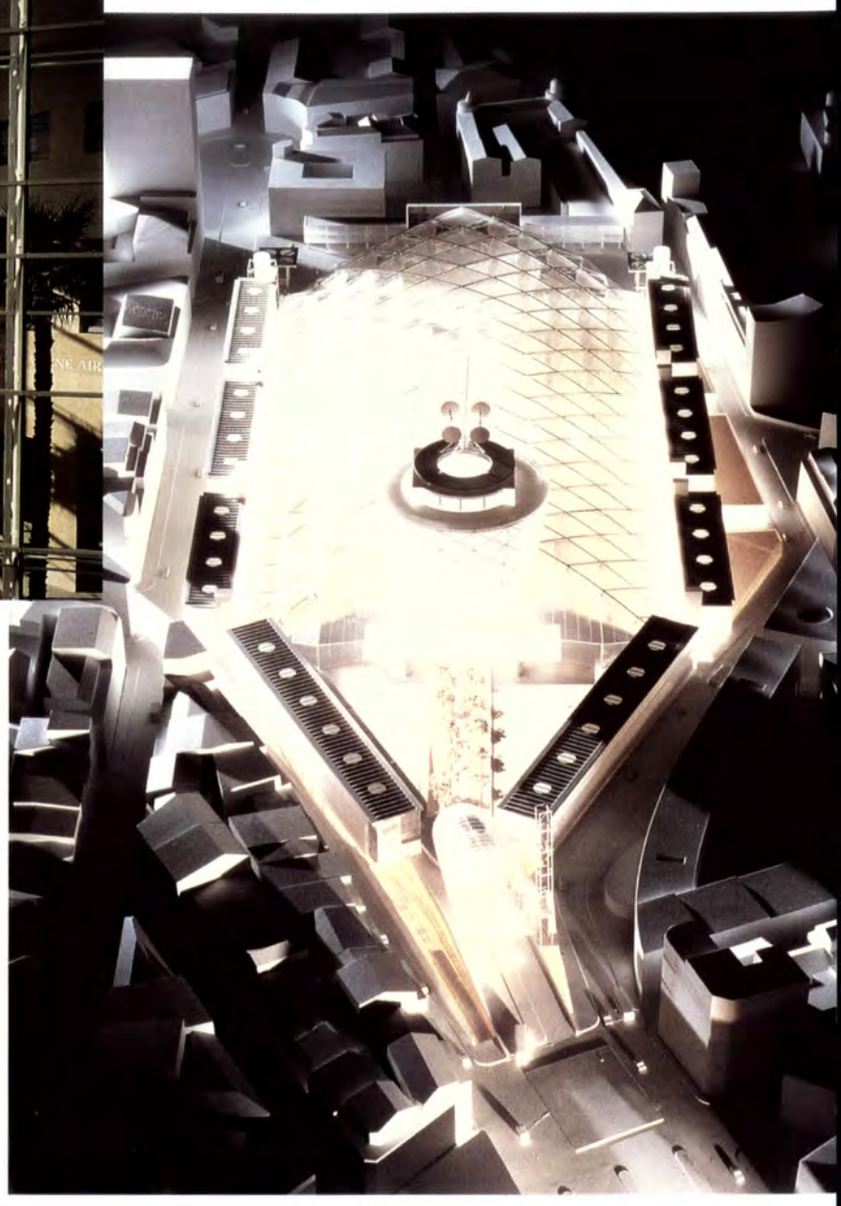
see also Richard Rogers' proposed Terminal Five at Heathrow), and Grimshaw's English airport work (fuselage metaphor) among others.

In the United States, where massive familiarity with internal air travel made airports run-of-the-mill places years ago, activity is intense from such firms as Gensler and HOK. In recent years, the most telling image of a new airport is Denver, Colorado – the largest in the US – where architects Fentress, Bradburn and Associates responded to the mayor's desire for a landmark by creating a dramatic fabric tented roof – effectively a series of tepees – over the central circulation area. In the view of Eustis Helmuth, of Parsons Brinkerhoff, the distinctive appearance of any new airport is an essential criteria for the design to be a success. As well as passenger convenience, efficient airline operations, revenue generation from non-aviation sources, incremental expansion potential and security Helmut believes that local image is an essential component of the well-planned airport. A passenger arriving at an airport should know where he is both from the air and on the ground. The airport should reflect the local environment and culture. This sense of orientation is important to the passenger. Also as airport designs become an ever more familiar sight in north American culture the creation of a sense of identity will be in stark contrast to the sterile anonymity of the traditional airport and may sustain its lifecycle.

It could also be said that the creation of local image represents an economic necessity as since the 1960s it has been rare for an airline to build a terminal. Instead financing has become the role of the airport itself. Nevertheless, the commitment of the airlines to the terminal can be important for the overall costing of the terminal facility. By meeting the specific design requirements of the airlines during design expensive retrofit can be avoided and the original identity of the facility can be maintained. The original Hartsfield International Airport, in Atlanta, has undergone just such a redevelopment with the Olympic Games in mind.

So it appears that, short-life though transport buildings may be, rapid though the need for change always is, they can indeed reserve some space for architecture – at least for a year or two. Alsop and Störmer's DFDS canted double-decker ferry terminal in Hamburg, a descendant of Alsop's earlier, more organic shipfish' project, gives the line an identity. Pritzker prize winner Rafael Moneo gave his San Pablo Airport at Seville in Spain a sense of

Nick Merrick, Hedrich-Blessing



Above *John Wayne Airport, Orange County, California. Design architects for the project – Gensler Architecture, one of the leaders in airport design in the US.* ***Right*** *Michael Wilford and Partners' Model of the Abando Interchange, Bilbao. It will forge strong connections between the two halves of the city, revitalising the central area. It consists of a central bus station for suburban and intercity bus services, and two new railway stations*

solidity and history by making the departures hall into a series of reassuring Roman vaults, and choosing domestic materials.

Also in Spain, the moderne Huelva bus station by Cruz and Ortiz shows what can be done with the turbine-like plan given by a circular arrangement of bus pull-ins. It shows what Venice missed by not building Jeremy Dixon and Ed Jones's 1991 competition-winning Piazzale Roma bus station in the city, which would have been at least its equal. In general, bus terminal design remains the poor relation in any survey of transport architecture, perhaps because of the cost-paring, low-class associations of this form of traffic. Very few local authorities or companies are prepared to invest in good architecture where the buses pull up.

It is true that, in railway design, one can benefit from the structural expressionism of Santiago Calatrava at Lyons or Grimshaw in London. True that metro design is back on the agenda with stations by Jourda & Perraudin in Lyons, by Foster in Bilbao, by Terry Farrell in Kowloon (see projects following for these last two) and by a clutch of top British names for London's Jubilee Line. True that even petrol filling and motorway service stations are now receiving serious design attention. Still, it is indubitable that the most money, worldwide, is still being lavished on airport architecture, and for good reason: sheer throughput.

Norman Foster's Chek Lap Kok airport in Hong Kong, bristling with aeronautical metaphors from its aircraft-like plan form to its roof details, built like Kansai on an artificial island, will when fully complete handle 87 million passengers a year. With that kind of processing power, it follows that airport buildings have enormous potential to extract money from bored waiting passengers. Hence the fact that all airports, all over the world, are now adopting the British practice of turning into shopping centres.

Retail, quite simply, is far more profitable than aircraft handling. As one somewhat cynical airport architect put it at a public seminar on the subject last year: does a shopping centre really need a runway attached? Of course it does. Without the runway, there would be no captive market. Soon, the only dedicated air transport architecture will be the buildings the public does not see: the servicing hangars, or, such as you will find in the Hampshire countryside designed by BDP, the vast en-route air traffic control centres. For everything else, refer to retail mall design principles. **WA**

Transportation Terminals

Hanscomb Associates

Historically, transportation terminals have remained independent of each other: railway stations serve trains, airports serve aircraft... Hanscomb Associates look at the move towards greater integration of the total trip for the traveller.

A phenomenon of the twentieth century is the growth of transportation. We rush from place to place, even if it is leisure time. However, we can hardly call twentieth century travel leisurely. The combination of more people travelling further, faster and instant global communication contributes to the sense of a "small world". Quick, long distance travel produces its own unique problems for terminal designers. One problem is the need to orientate arriving passengers to a new and often totally foreign environment.

Large capacity transportation terminals are a challenge of the modern era to designers. The invention of new transportation modes is recent in man's history. Ships were the primary means for centuries. Coaches and wagons allowed overland travel, but with less capacity. In the nineteenth century, railroads changed the way we travelled and provided a metaphor for the changes in society. High capacity, high speed modern travel was the starting point in our fascination with the buildings from where we arrive and depart.

If the nineteenth century belonged to the train, the twentieth century belongs to the airplane. Airports are very different from train stations. There is a perception that train stations tend to stay the same over a long period of time, perhaps this is because air travel is still young and growing. There are constant renovations and additions to keep pace with growth and industry changes. For example, the changes in airline routing from point-to-point to hubbing significantly effected the functionality of many airport terminals.

What does the future hold?

The world-wide airport market is very active. There are numerous projects recently completed, under construction or being planned. *(See Table 1).* World-wide value of airport projects either being planned or constructed is well over US$500 billion. Asia is a particularly active market for new and expansion projects, with China being the biggest market for the next 10 to 20 years. During the next five years, 15 airports are planned. This includes the new airports for Guangzhou and Shanghai, and a major expansion for Beijing.

Growing travel puts greater demands on transportation services. Efficient use of existing capacity and improved transportation services becomes more important. Historically, transportation terminals and their associated infrastructure have been independent of each other. There is a move toward greater integration of the total trip for the traveller. Multi-modal terminals reflect the growing realisation that:

- transportation resources need to be better utilised
- the traveller requires better service, which a total trip concept promotes.

Consider the alternatives

Each mode of transportation (water, rail, road and air) poses unique terminal planning difficulties for designers. Transportation terminals are inextricably linked to their associated infrastructure mode. Perhaps the transportation mode shapes the terminal more than the passengers themselves. Consider the following:

- Terminal location: we locate train and bus stations in urban areas, where they are part of the urban context. We place airports at the periphery of urban areas where they establish their own context.
- Travel distances within terminals: train and bus terminals are compact, with distances between loading areas or between arrival and boarding areas usually being short. Airports typically have longer travel distances requiring intra-terminal transportation systems (trains or moving walks).

Early terminal architecture provided a place for the celebration of arrivals and departures. The idea of a trip as a special event influenced their design. They were also a source of achievement and pride for the local community, which late-nineteenth- and early-twentieth-century train stations clearly illustrates. The train station model was a grand passenger building connected to functional glass and steel boarding platforms, which provided a proper place for the passenger and a proper place for the train. One wonders how much celebration occurs around travel nowadays. Has it become too commonplace? Perhaps all that remains is civic pride and the desire to impress visitors.

Still at their core, transportation terminals are organised areas for the flow of people and goods from one form of transport to another – arrival, processing, loading, departure. An industrial processing facility could serve as the model for transportation terminals. The architecture becomes subservient to the process.

"An industrial processing facility could serve as the model for terminals...architecture becomes subservient to the process."

With two models to use, transportation terminal design provides a wide spectrum of possibilities for designers. The philosophies are readily apparent in the resulting designs. They also greatly influence the final cost to the owner. At Hanscomb we find the classification of airport terminals as low, medium or high profile to be useful when considering their costs. The original Hartsfield International Airport in Atlanta which those coming to the 1996 Olympics will experience, would

***Table 1.* Recent & Current Airport Projects**

New Airports	New Terminals
Bangkok (2000)	Manila (1997)
Seoul (1998)	Ho Chi Minh (Plan)
Hong Kong (1997)	Tel Aviv (1998)
Seapng (1997)	Beirut (1997)
Shanghai (1996)	Bahrain (1994)
Gunagzhou (1996)	Cairo (Plan)
Kansai (1994)	Heathrow (2002)
Taiwan (Plan)	Prague (1996)
Bombay (Plan)	Frankfurt (1994)
Doha (1997)	Madrid (Plan)
Austin (1998)	Brasilia (1998)
Denver (1994)	Vancouver (1996)
Oslo (1998)	New York, JFK (2000)
Athens (1998)	Boston (2000)

***Table 2.* Airport Terminal Costs (in US$)**

		Low Profile Cost/m2	Medium Profile Cost/m2	High Profile Cost/m2
Terminal (including connecting walkways to landside facilities).	Arch/Struct	850 - 1,125	1,050 - 1,450	1,400 - 2,100
	Mech/Elect	425 - 550	500 - 600	525 - 675
Concourses (including connecting walkways to terminal).	Arch/Struct	850 - 1,175	1,025 - 1,375	1,300 - 1,850
	Mech/Elect	400 - 500	500 - 600	500 - 650
Baggage Handling System	–	175 - 425	175 - 425	175 - 425
Major Equipment (security – boarding bridges, etc).		100 - 200	100 - 200	100 - 200

be considered a low-profile terminal. However, recent additions are more high-profile. The Denver Jeppesen and Kansai International Airports are examples of high-profile terminals.

The price of success

We provide some general guidelines for airport terminal costs using the classification system in *Table 2*. The costs are for the US and may be categorised using the Hanscomb International Cost Index published by *World Architecture*. However, comparing airport terminal costs is not so easy because there are so many variables.

Hanscomb is active in providing cost advice on many airport projects. Jeff Hodgetts of Hanscomb Chicago explains that there are issues of configuration and function that drive airport terminal costs:

- Overall layout is a major factor. Is the terminal an island type or radiating spokes from a central hub? How are landside and airside terminals connected?

- Terminals tend to be a collection of long, narrow spaces connected together by long, narrow concourses. This lowers the floor-to-wall area ratio, which typically means higher costs.

- Floor-to-floor heights can be very high. This increases exterior wall area, which in turn increases costs.

- Sound attenuation contributes to extra cost. Often terminals use lots of laminated glass, particularly airside which is expensive.

- Use of double or single loaded concourses will impact overall square foot requirements.

- Security issues impact many areas: passenger checkpoints and equipment, electronic detection systems for baggage, minimal distance from vehicle parking to terminal.

- The type of baggage handling system will impact overall costs.

A broader perspective

Cost issues, such as the size of a project and an addition or new work are common to any project. They are particularly important for airport terminals. For example, airside work at an active airport raise security and safety issues and ultimately increases the cost of work.

These are some larger issues that impact the cost of airport terminals:

- Type of owner. Airport terminals may be functional buildings which are designed to keep pace with demands and generate income to cover debt service, ie a low profile building. They can be image buildings, designed to attract business and instil community pride, ie a high profile building. The cost range between these can be quite significant as shown in *Table 2*. The owner, type of financing, and community expectations will often determine this.

- Type of terminal. There are several classifications to consider, but two important ones are:

Domestic vs International. Special considerations for passenger and goods flow control exist for international terminals. You must keep separate the "clean" and "dirty" traffic. Other special requirements increase space such as customs and immigration control areas and larger meeter/greeter areas. Ultimately there are significant cost differences. Dave McNamara of Hanscomb emphasises the need to understand the programme differences when comparing terminal costs between the US and other countries. In the US, most airports are domestic. Even US international airports have a very low level of international to total gates. In Europe and other areas, most airports are international airports with a higher percentage of international gates than found in the US.

Hub vs regional. Originating and departing (landside) facilities occupy a lower percentage of space in hubbing airports. Larger airside facilities accommodate the passengers passing through the terminal.

- Boarding facilities. Loading bridges, bussing to remote piers, and apron walkout are all valid boarding methods. Some are more appropriate depending on the type of service.

- Shared or exclusive gate use. Who controls the gates, the airlines or the airport authority? This is a function of financing arrangements, but ultimately effects the required size to meet capacity demands and future growth decisions. Shared gates can provide the necessary capacity with fewer gates. Preferential gate assignments help assure that the same flight uses the same gate every day. This not only impacts the programmed space requirements, but the equipment. Each airline shares common equipment (ie commuter terminals). In the US, airlines tend to control the gates, but in other areas of the world airport authorities control them. There is, however, a trend towards shared gates in the US, when financing arrangements permit.

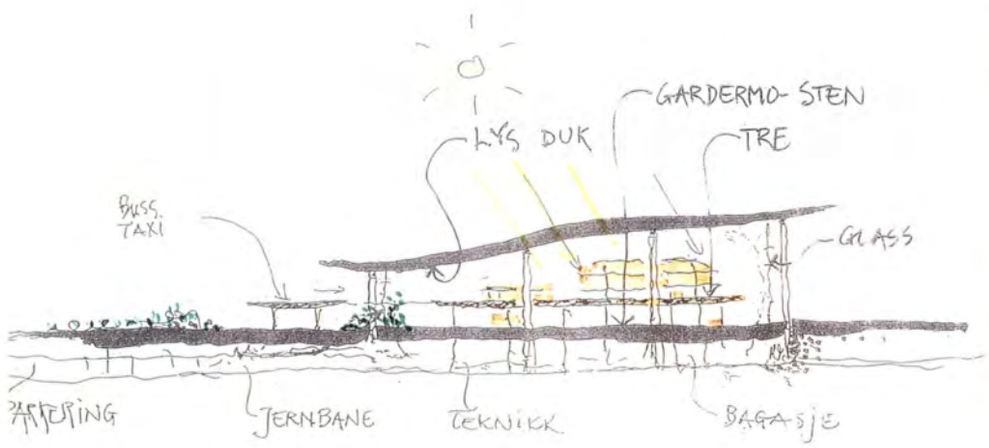
- Amenities provided. Airport terminals are increasing the level and types of non-aviation revenue producing area. Larger retail areas, restaurants, business meeting facilities, and hotels are common in the new terminals or are being added to older terminals.

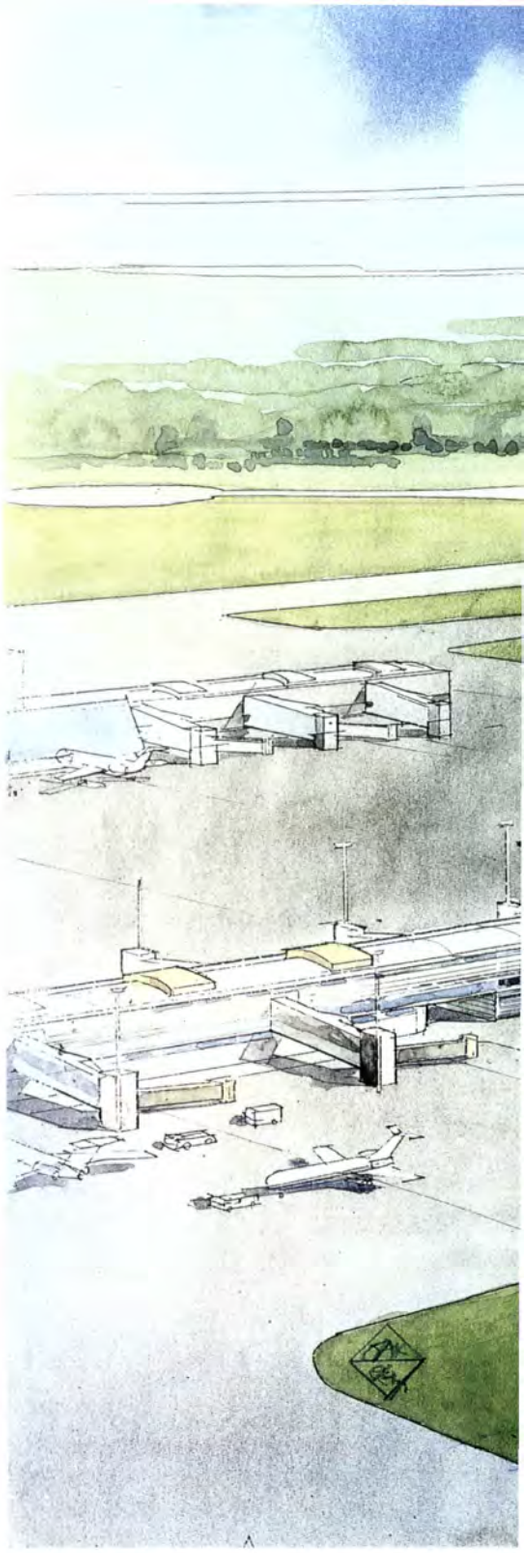
Transportation terminal design will continue to challenge designers with new technologies. Railroads required railway stations in the nineteenth century. Airplanes required airports in the twentieth century. Perhaps terminals for space travel will be our challenge for the next century. **WA**

Oslo International Airport

Gardermoen, Norway

Architects: AVIAPLAN – Narud Stokke Wiig, Niels Torp, Skaarup & Jespersen, Hjellnes Cowi





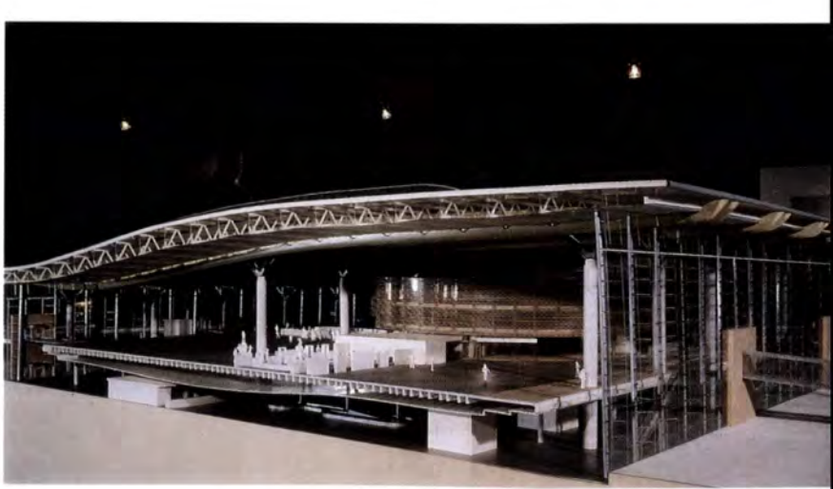
Above left *Concept sketch for the main terminal building.* ***Above*** *Watercolour of the scheme showing the terminal building with the railway station to the west, and the 90 metre control tower to the southwest.* ***Right*** *Model photographs of the terminal building showing the roof rising to the north following the direction of passenger flow through the building and providing additional space for service blocks.* ***Far right*** *The ground floor will be clad in black slate and granite. The departures level above appears as a free floating timber board*

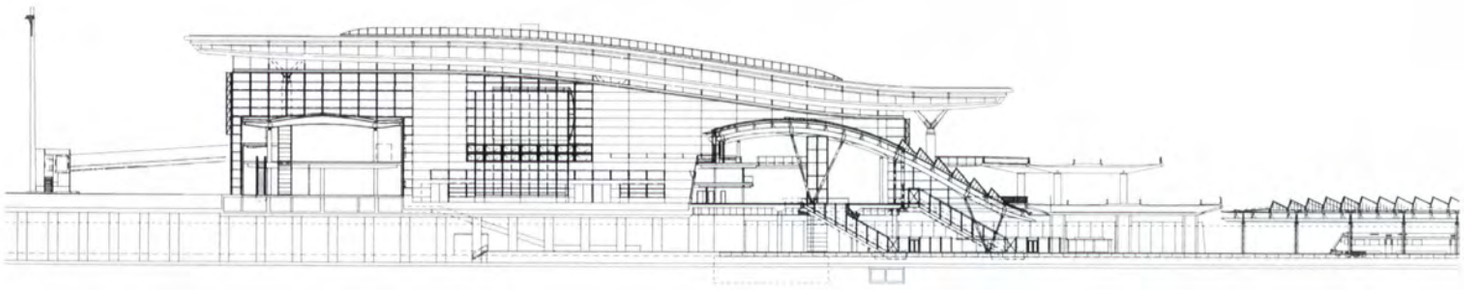
In the summer of 1993, as a result of the air traffic to and from Oslo Airport Fornebu more than tripling in the last 20 years, the largest land development project in Norwegian history was conceived. Oslo Hovedflyplass AS (OHAS), a subsidiary of the Norwegian Civil Aviation Administration, will complete the new international airport at Gardermoen in October 1998. Their aim is to ensure that this is Europe's most modern and flexible airport while remaining time and cost effective.

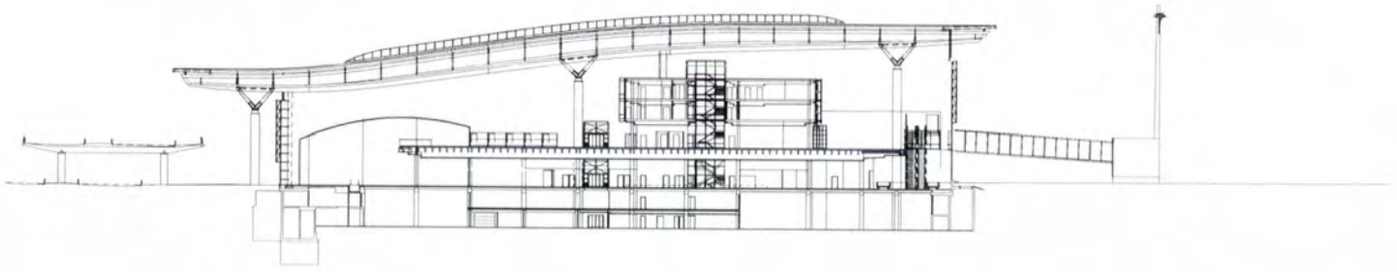
The designers for Gardermoen are made up of a joint venture between Narud Stokke Wiig, Oslo, Niels Torp, Oslo, Skaarup & Jespersen, Copenhagen and Hjellnes Cowi, Oslo – three architectural practices and a multidisciplinary engineering firm, incorporating a total staff of around 200.

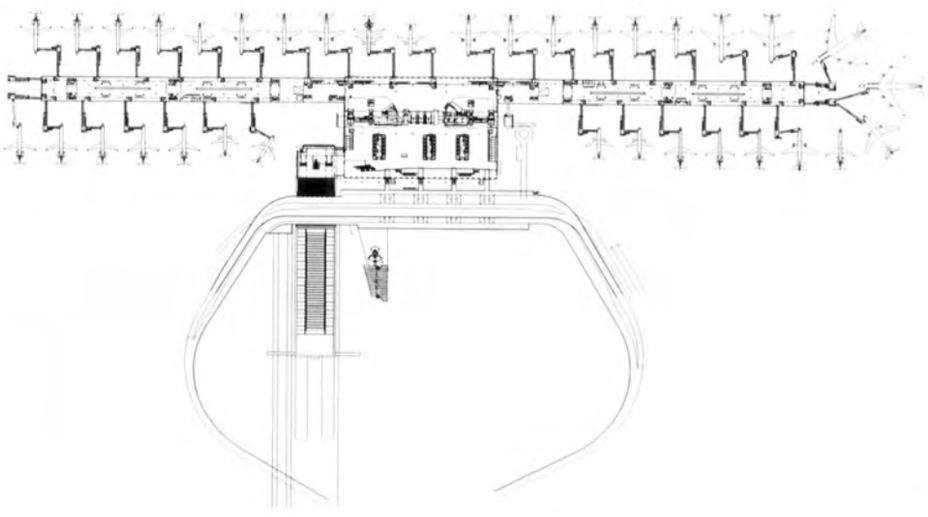
The concept

The architects aimed to characterise the terminal building with a "Norwegian and Nordic tranquillity – a discreet monumentality". Natural materials, light, technology and building forms are uniquely combined to produce Norwegian design at its best. Advanced timber technology is displayed in the hardwood cladding used for the internal buildings. The ground floor level will be clad in a combination of black slate and granite, and the departures level above will appear as a free floating timber board. Norwegian marble will be used in areas most exposed to wear.

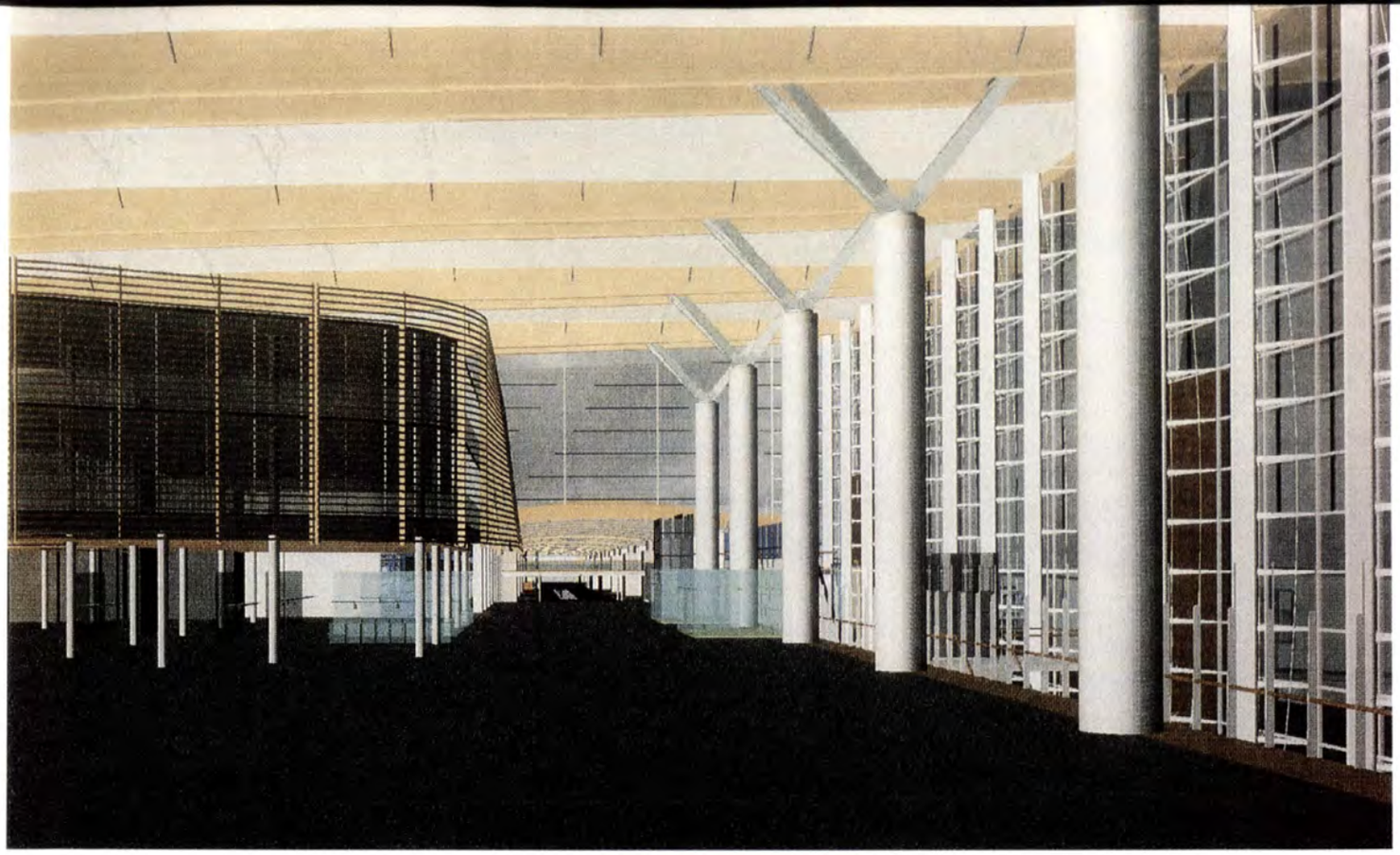




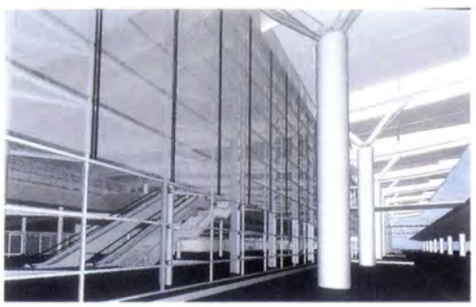




The terminal building complex consists of a central building with service blocks, piers A and B and a railway station, each individually articulated. (Pier B will be completed at a later stage.) The roof of the central terminal rises to the north, following the direction of passenger flow through the building and providing additional space for service blocks. The building contains ticket sales, check-in, security and immigration control, shopping, bars and restaurants. Arriving passengers circulate on the ground level in a double-height space filled with planting and sculpture on the landside area, while departures are from the upper level, along with the service blocks. Here 72 check-in desks are grouped in three free standing islands.



Opposite page from the top *Computer image of the pier, the main transport artery carrying pedestrian traffic between the central building and the aircraft. North-south section through the terminal building. South-north section. North elevation through the scheme showing the linear plan of the central terminal building and pier A. Overhead plan of the 34 aircraft stands connected to the central terminal building at pier A.* ***Above computer generated images, clockwise from the top*** *Interior of the terminal building showing departure level to the left. Interior of railway station. Traffic forecourt*



Thirty four aircraft stands are connected to the central terminal building at pier A. When pier B is completed there will be a total of 45 aircraft stands, and including pier C the potential for passenger bridges connected to piers is approximately 90.

The pier

The pier is the main transport artery carrying pedestrian traffic between the central building and the aircraft, with waiting rooms either side. Arriving passengers use elevated galleries above the departure areas. The central space, approximately 18 metres wide, is divided by interconnecting bridges creating three open halls, each about 100 metres in length. Technical shafts at 36 metre intervals accentuate the height of the space which is lit by clerestory glazing.

The railway station

A new railway line (Gardermobanen) will be built from Oslo through Lillestrøm, Gardermoen and Eidsvoll. Six airport trains will run in both directions between Oslo and the main airport every hour. Local trains, InterCity and express trains will also serve the airport, with the objective that at least half of all air passengers will travel to and from the new airport by public transport. Aviaplan have also designed the new railway station. The station hall is a pavilion over the platform area and links the trains with the terminal building itself. **WA**

Project	Oslo International Airport Gardermoen
Client	Oslo Hovedflyplass (OHAS)
Architects	AVIAPLAN – Narud Stokke Wiig, Niels Torp, Skaarup & Jespersen, Hjellnes Cowi
Project architect	Gudmund Stokke
Design coordinator	John Arne Bjerknes
Concept group	Hans Haagensen, Niels Torp, Ole Wiig
Advisors:	
Structural design	Chris Wise, Ove Arup & Partners, London
Lighting design	Andre Tammes, Lighting Design Partnership, Edinburgh/London
Baggage handling	Paul Benefield, WH Pacific, Seattle
Engineers	Reinertsengruppen, Oslo-
IT Systems	IGP as, Oslo

▲▼ Alex Levy

Passenger terminal, Lille airport

Lille, France

Architect Atelier d'Architecture et d'Urbanisme Denis Sloan

Architect of the international passenger terminal at Lille airport, Denis Sloan claims that his design "symbolises the new dynamism of the town that is determindly turning towards the twenty-first century". The airport, which has just been completed at a cost of £30 million, is reminiscent of the sculptural forms of France's Italian neighbours, the Futurists. It is a built symbol of an aircraft poised to take off. The form of the building is sleek with a pointed nose like concord and a triangular tail fin which is actually a separate seven-storey building. It is hoped that this 2,500 square metre block of rentable office suites which will help pay for the whole development.

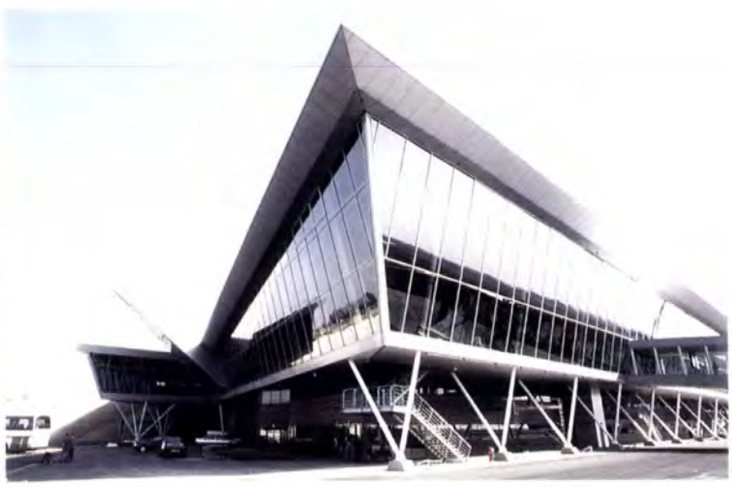
As the first French example of adopting the US method of using a separate project/construction manager, it is interesting to assess the results of this project. Lille Roubaix Tourcoing Chamber of Commerce and Industry decided to enlist Bovis as the project/construction manager after Sloan won the competition for designing a new 18,800 square metre terminal. Sloan's wife described Bovis' supervisory role as "heavy" and claimed that they had completed previous projects, such as a 250 000 square metre university outside Paris without a project manager.

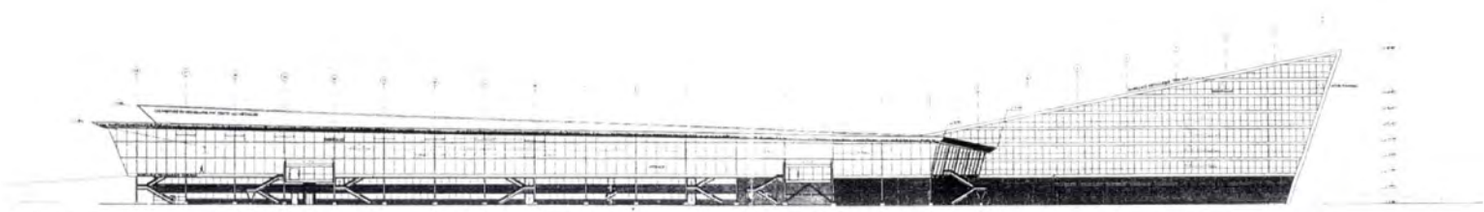
Despite this, the new airport was built

Opposite page *Frozen movement: the international passenger terminal at Lille airport recalls the work of the Italian Futurists.* ***Top*** *A built symbol of an airplane poised for take-off. The triangular "tail fin" is a separate seven storey building containing 2,500 square metres of office space.* ***Left*** *View of passenger terminal down concourse, illustrating pointed nose and tail fin; like a Concorde*

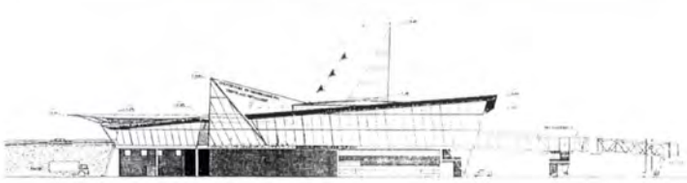
Below *Close-up view of the tail fin. The use of colour-coated steel in preference to aluminium cladding contributed to the remarkably low cost of the project.* ***Below right*** *The dynamic forms of the terminal building symbolise the rapid development of Lille as a 21st-century urban centre*

Alex Levy

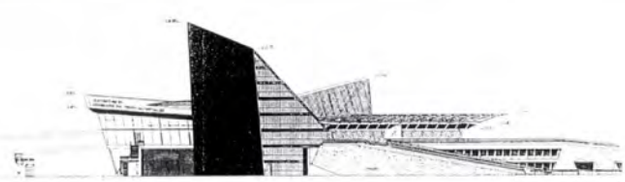




South elevation



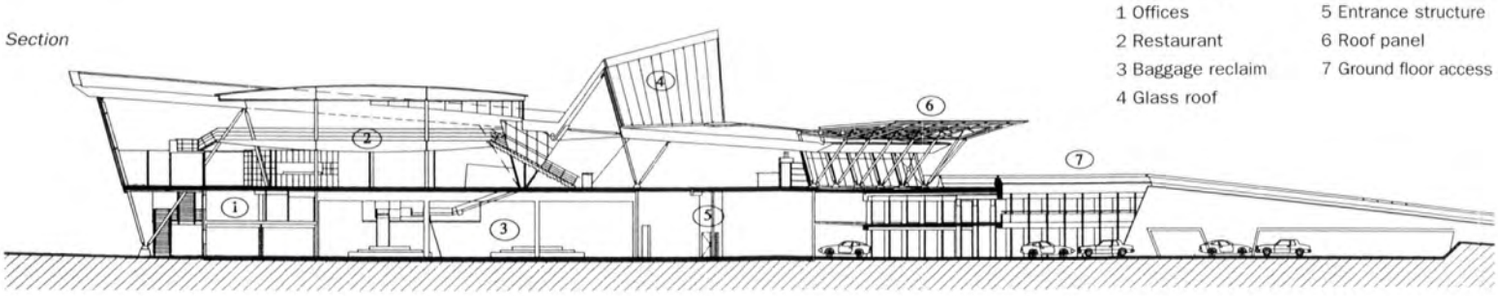
West elevation



East elevation

North elevation

Section

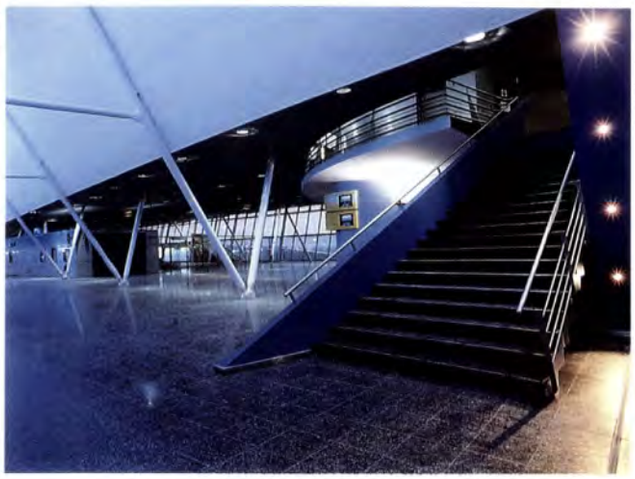


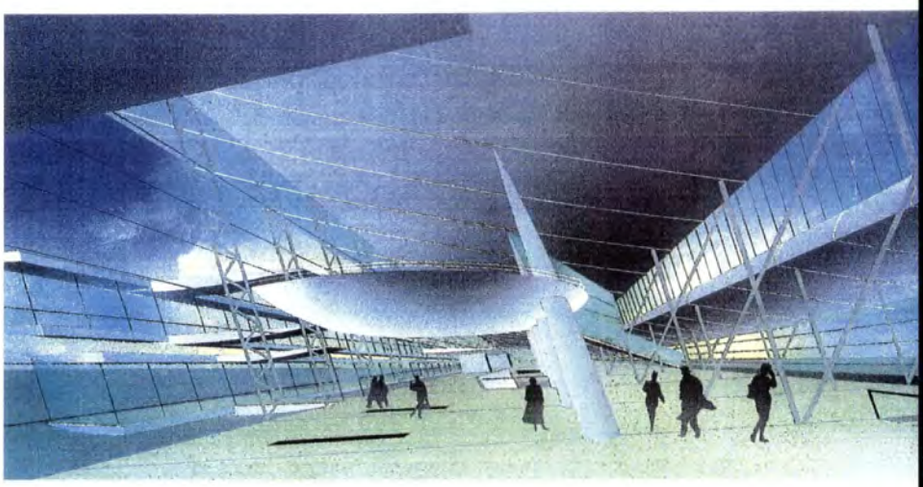
Section – Key

1 Offices
2 Restaurant
3 Baggage reclaim
4 Glass roof
5 Entrance structure
6 Roof panel
7 Ground floor access

Below left *The internal space is divided by movable screens making it flexible and easy to use.* ***Below*** *Artists impression of the interior, dominated by striking, futurist angles and the contrasting form of the entrance*

Alex Levy

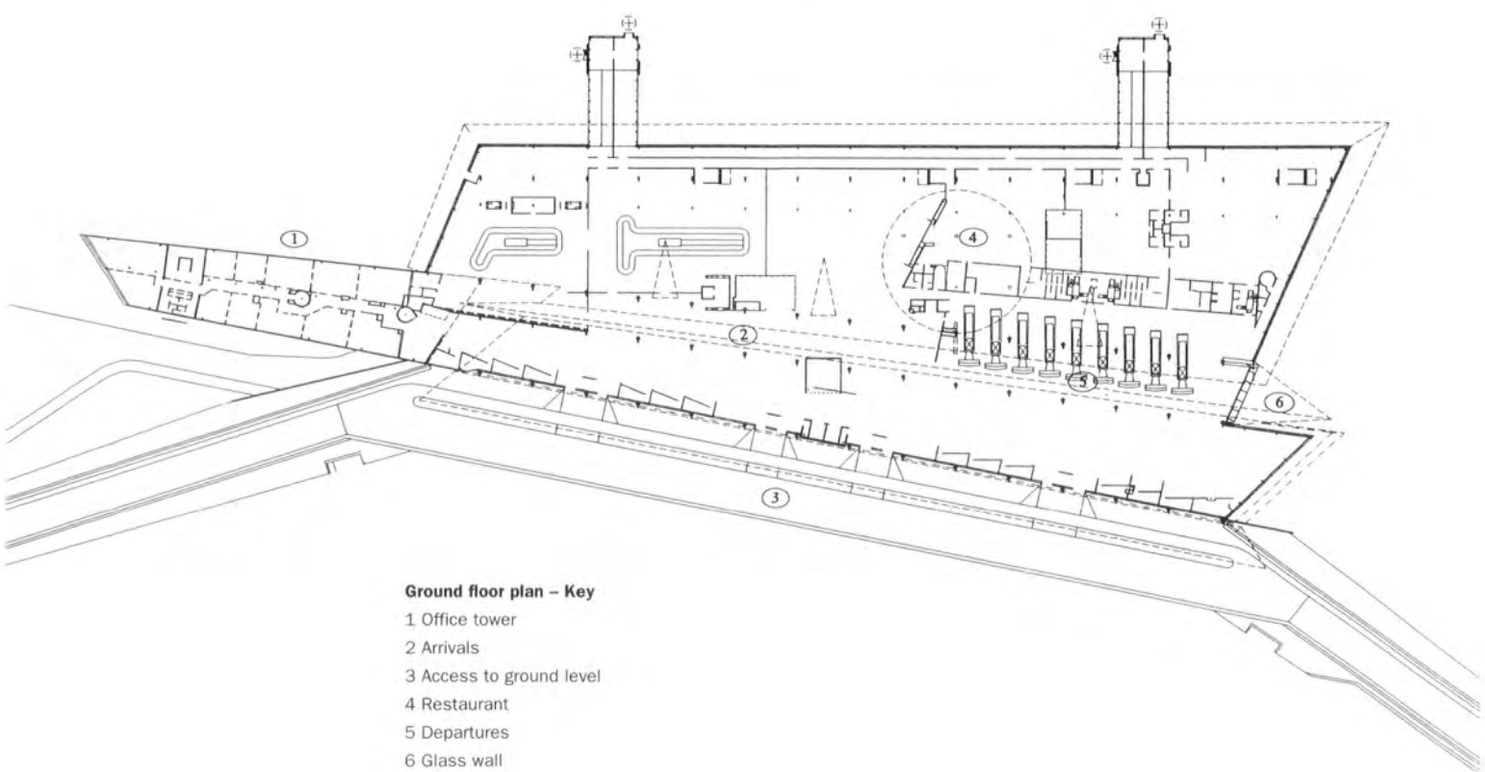




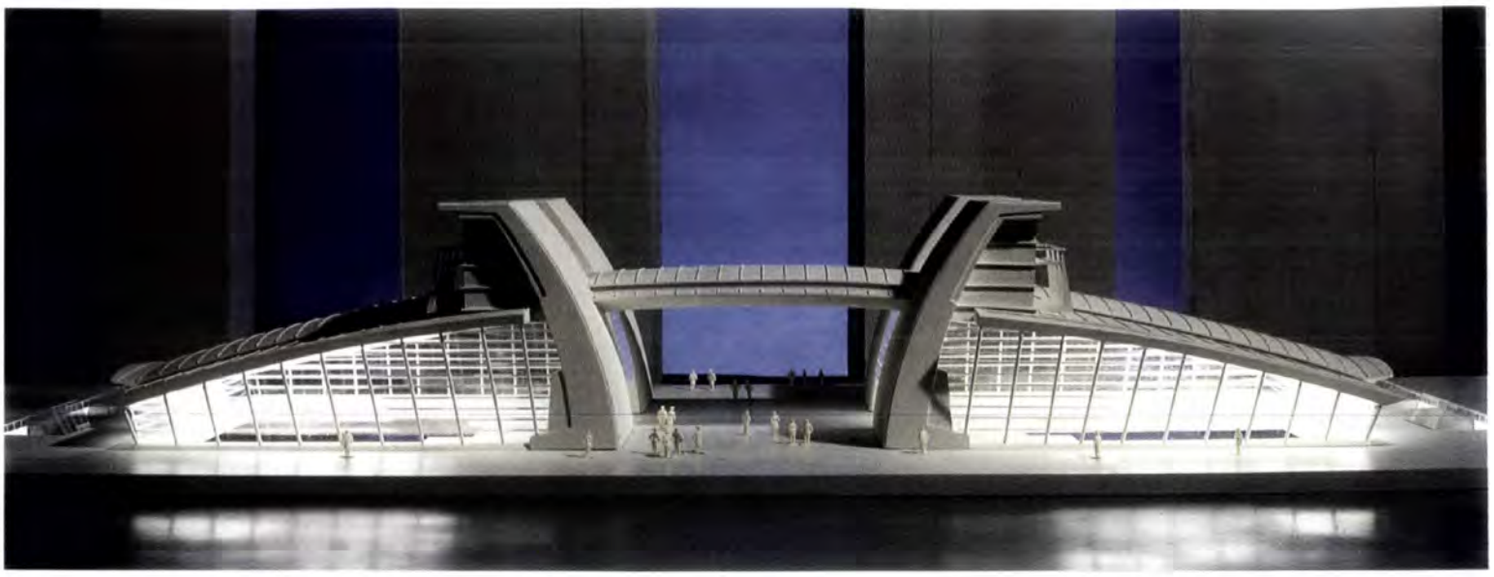
remarkably cheaply at a cost of only £19.6 million or £1,043 per square metre. A further £10 million was spent on car parking, external works and fees. Between choosing Sloan's competition entry in 1990 and its realisation, costs were reduced by 30 percent. This was due largely to the choice of materials: colour-coated steel rather than aluminium cladding; using industrial crinly tin to clad the undercroft; single-membrance PVC roof covering rather than zinc; terrazzo instead of marble flooring and perforated steel panels for the ceilings.

The internal spaces are simple asymmetrical shapes. Like Norman Foster's Stansted airport, the passenger facilities are nearly all housed in the upper hall with service areas and offices on the lower levels. The internal space is divided up with movable screens making it flexible and easy to use. Sloan's emphasis on flexibility is evident in both the scheme and the details and he has already planned a possible extension to the building. **WA**

Project	New passanger terminal, Lille Airport
Architect	Atelier Sloan
Associate architect	Laloux & Lebecq
Aeronautic consultant	Sofreavia
Structural engineer	Seca Structure
Services engineer	Cabinet Starck
Building economist	Cabinet TET
Construction manager	Bovis



Ground floor plan – Key
1 Office tower
2 Arrivals
3 Access to ground level
4 Restaurant
5 Departures
6 Glass wall



Nigel Young

Kowloon Station
Hong Kong

Architects: Terry Farrell & Company Ltd

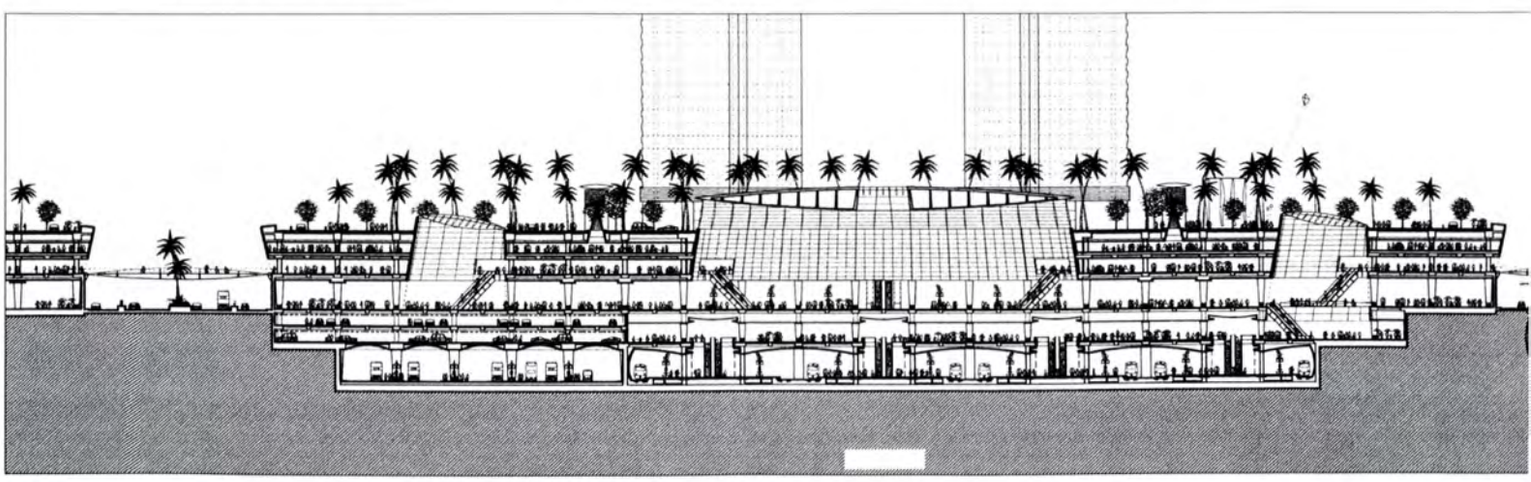
Terry Farrell & Company have made a considerable impact on recent building in Hong Kong. After the success of their distinctive Hong Kong Peak project they are now completing work on Kowloon Station, which is due for completion in 1997. When complete, the masterplan, including the station and commercial and residential buildings, will provide a focus for the development of a new city district, reclaimed from the west of Kowloon. The retail accommodation is arranged in a multi level configuration with dedicated parking zones. It has been developed from an overall masterplan strategy proposed by Terry Farrell and Company in full consultation with specialist consultants and advisors.

The station is part of the MTRC's (Mass Transit Railway Corporation) proposals to provide a new rail link connecting Hong Kong Central to Foster and Partners new airport at Chek Lap Kok. As well as providing an interchange between three separate rail lines the design incorporates facilities for airport check-in connections and coach, bus and private transport. All elements of the design will be linked by a mezzanine interchange concourse.

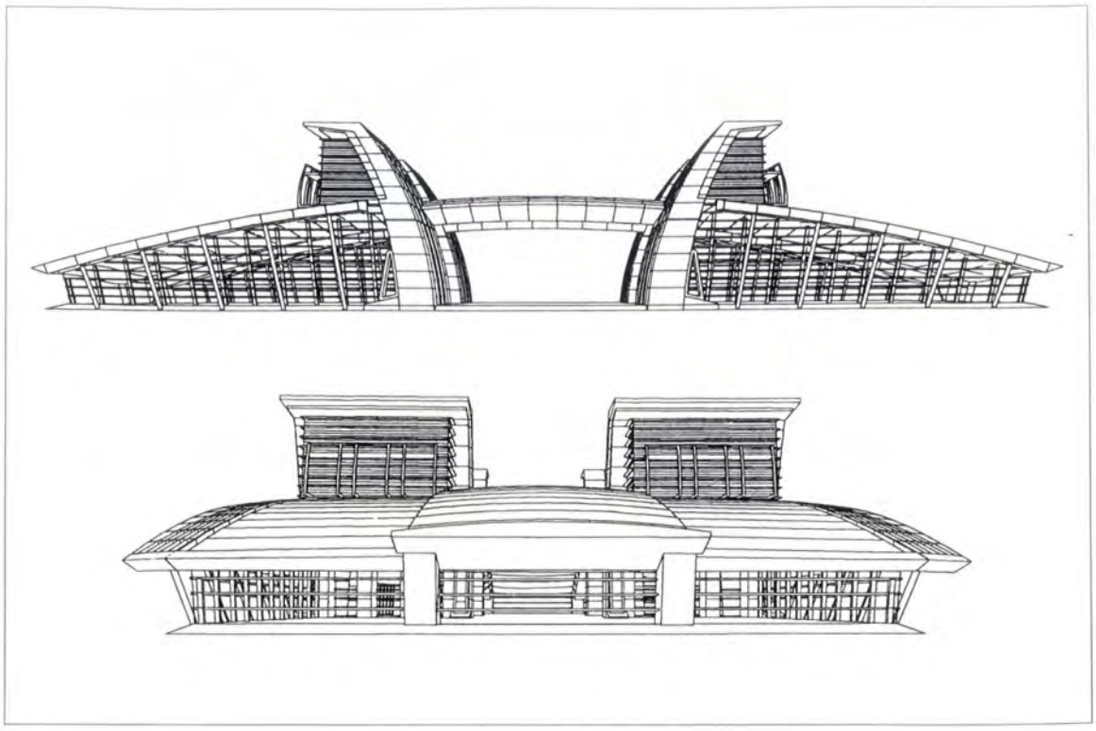
The project will also include the urban design masterplan for air-rights development over and around the station. The masterplan for 11 million square feet of mixed hotel, office, retail and residential space is organised around three public squares, which will provide open space and gardens as the focus for the development.

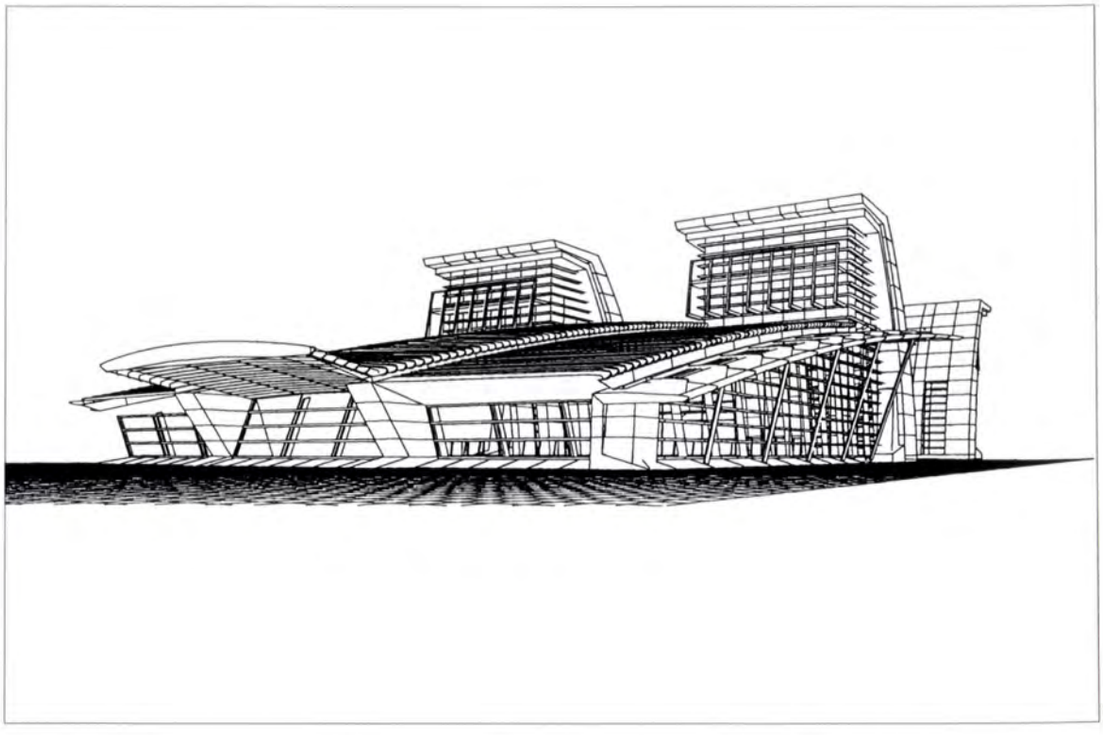
The station and air rights are connected by three large conservatories, one in the centre of each square. These will bring the garden environment into the mezzanine, provide daylight in the station, and function as entrances to the station from the development podium.

The retail element comprises an area of 1,026,00 square feet and takes as its starting point the enclosed internal malls which are a common feature of retail facilities in Hong Kong. These are developed into a shopping environment based around a reinterpretation of linked squares and public spaces, and form the principal squares through which pedestrians pass when using the transport interchange. The spaces are fully integrated with the main pedestrian traffic routes from the associated development plots into the transportation system. **WA**

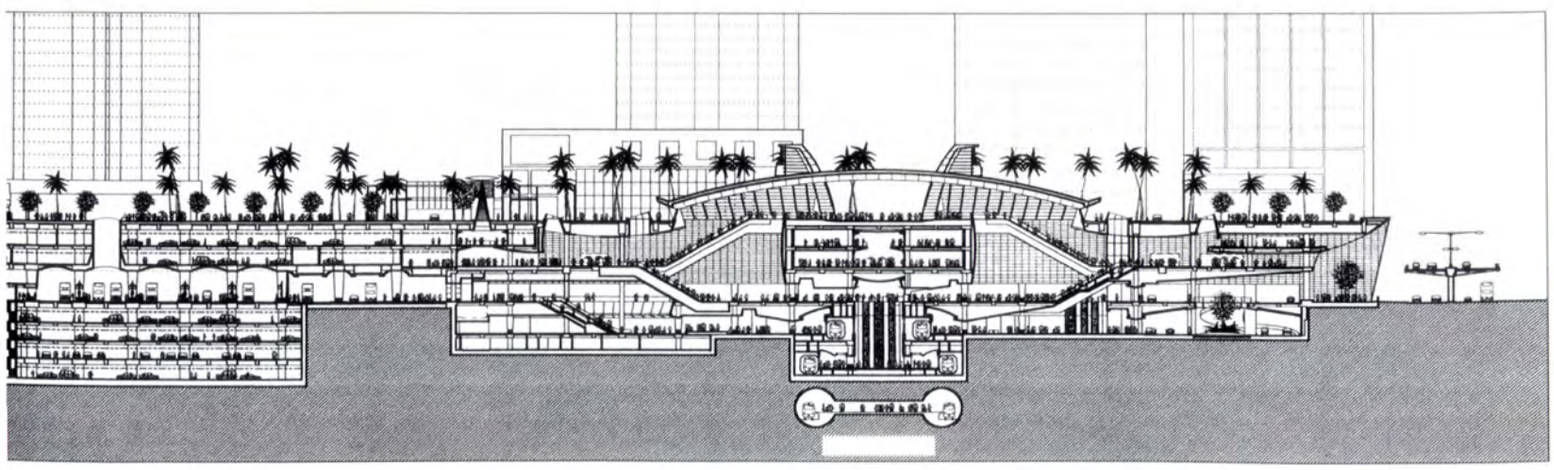


Opposite page *Model of phase 1 of Kowloon Station, part of the MTRC's proposals to link Hong Kong Central to the new airport at Chek Lap Kok. Facilities are provided for airport check-in connections and coach, bus and private transport.* ***Right and below*** *Computer drawings of the station showing the distinctive profile.* ***Bottom*** *Section through the masterplan showing the hotel, residential and retail complex to the left, and the main station to the right. The three conservatories, one in the centre of each square (to the left) bring the garden environment into the mezzanine concourse, and provide daylight. They are also entrances to the station from the development podium*





Project: Kowloon Station
Client: Mass Transit Railway Corporation
Architect: Terry Farrell & Partners
Structural Engineers: Ove Arup & Partners
E & M Engineers: Parsons Brinckerhoff (Asia) Ltd
Quantity Surveyor: Levett & Bailey
Main Contractor for station: KEC Joint Venture (Kumagai Gumi Co Ltd, Entrecanales Tavora SA, Cubiertas Y Mzov SA)
Main Contractor for Kowloon South Tunnels and Ancillary Buildings: Amsoc Joint Venture (AMEC, Shui-On, China Fujian)



Holyhead Ferry Terminal

Holyhead, UK

Architects: Manser Associates

As the centre of the industrial revolution, the British Midlands is familiar with innovation. Moving manufactured products to the coast for export created a need for transport engineers and architects. Following in this tradition, the Stena Line have commissioned Manser Associates to create a port appropriate for their new vast gas-turbine-powered catamaran ferry, the HSS or high speed sea service for the route between Dublin and Holyhead. The sleek futuristic ferry required new docking facilities and a design consummate with Stena's investment in this high technology ship, which was fitted out in Finland and came into service earlier this year.

Manser are acting as sub-consultants to LG Moucel & Partners in this project which forms part of an overall redevelopment for Stena Sealink ports in Stranraer, Fishguard and Belfast to create a distinctive "corporate" image for Stena Sealink ports.

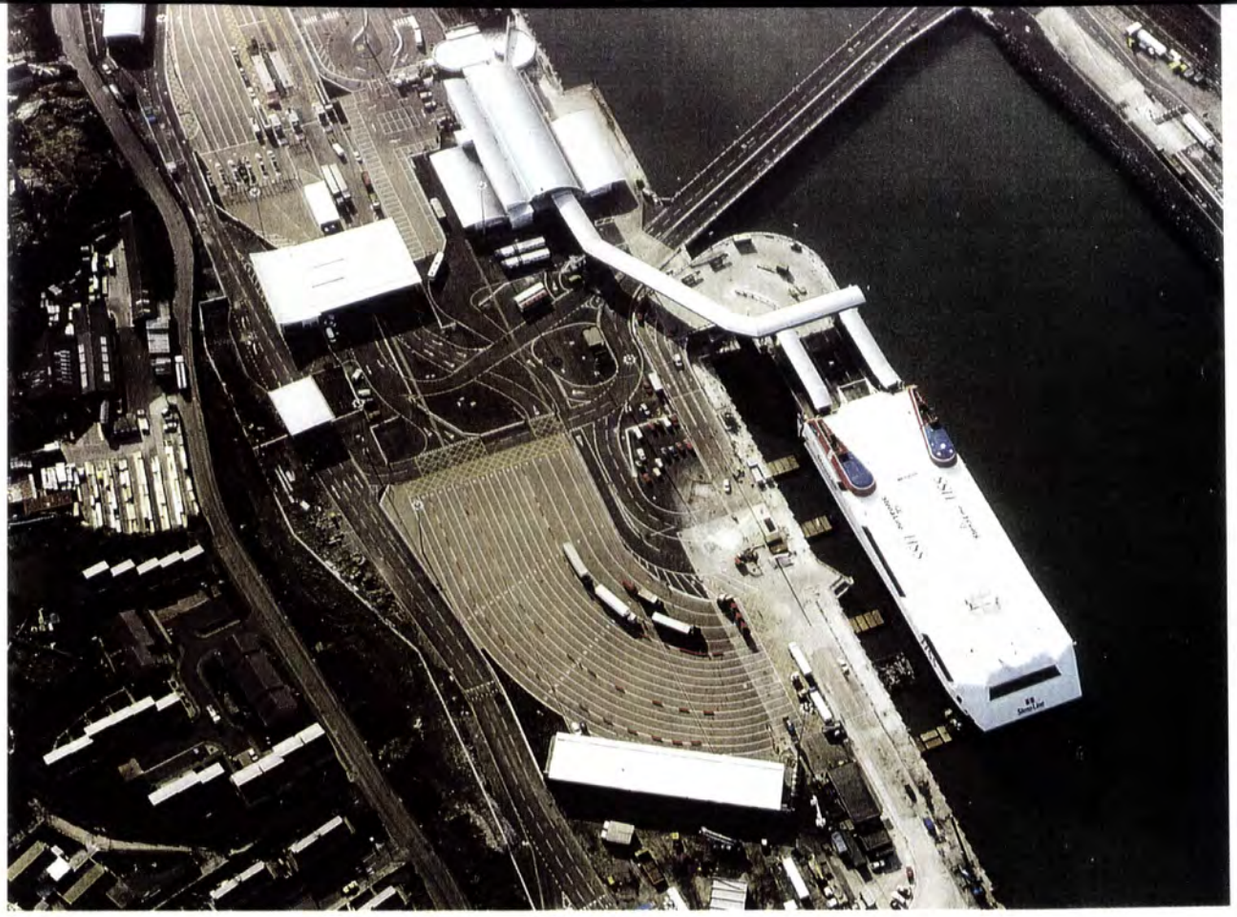
Some of Manser's previous projects, such as Southampton airport, were completed on very tight budgets. Holyhead is no exception, coming in at £550 per square metre. At Holyhead, Manser achieved this extraordinary "value-for-money" by creating a series of buildings with the same "family likeness" consisting of curved roofs and sinusoidal profiled silver aluminium cladding. This generic design lends coherence to the disparate collection of buildings on the East Dock: a terminal building (from which there will be a direct British Rail link between Holyhead and London Euston), freight check, car and coach check and amenity centre.

Inside, the buildings are light and airy with interesting views of the port, ships and town of Holyhead. From arrival to embarkation, the passengers route is designed to be straight forward. However, despite their functional approach, the architects have communicated the luxury of airline travel with proper embarkation lounges with cafes, duty free and direct connection via walkway bridges from the embarkation lounge to the ship.

Manser are a father and son firm and, as with much of their previous work, the Holyhead ferry terminal is an example of what can be done to enhance the built environment. Although it is not a landmark project it is a well-thought out design built on a low budget in a limited amount of time. Jonathan Manser is clearly proud of the speed and scale of this process: "Three years ago, the sense of desolation in Holyhead was palpable. But you only have to look at all this to realise that it must inject so much life into the town." **WA**

Project	Holyhead Ferry Terminal, Holyhead, UK
Client	Stena Sealink
Architect	Manser Associates
Engineers and Project managers	LG Mouchel & Partners Ltd
Main contractor	Costain C and B Ltd
Sub consultants	EWP Architect Alan Johnston Partnership
M and E Contractor	NG Bailey

Opposite page *Exterior view of the main terminal building. Although it is not a landmark project it is a well thought out design, built on a low budget in a short space of time.* ***Right*** *Aerial view of Holyhead Ferry Terminal, the disparate group of buildings seems homogeneous due to similarity of design. Manser Associates have attempted to create a "corporate" image for Stena Sealink thoughout their ports in the UK.* ***Below left and right*** *Curving roofs create a feeling of movement. Inside the space is articulated to lead passengers through the terminal towards the ferry*



Right *Departure lounge showing inventive use of natural light and simple materials can create the atmosphere of luxury travel in the manner of an airport lounge rather than a draughty seaport*

Brisbane International Airport

Queensland, Australia

Architects: Bligh Voller. Text: Carl Gardner

Modular, expandable, spaciously open-plan and with a maximum of controlled, natural daylight, these are the prevailing features of the nineties generation of international airports. Unfathomable passenger tunnels leading to distant satellites are hopefully a thing of the past.

Brisbane's new international terminal by architects Bligh Voller, which opened in the autumn of 1995, offers just such a design package. Despite its strict logistical constraints the terminal still manages to be both reassuringly legible as a building, and to incorporate local cultural, horticultural and climatic characteristics.

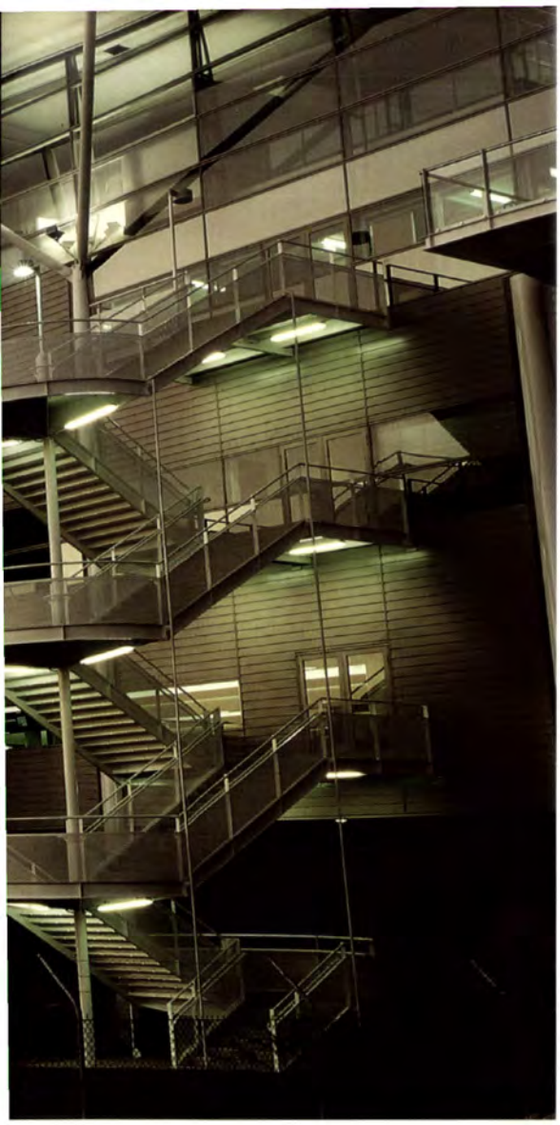
The 65,000 square metre structure, comprising concrete slabs on an exposed steel framework, is relatively simple in both plan and section – a symmetrical, rectangular block, with double vehicle ramps landside, horizontally segmented into separate arrival (ground floor) and departure (first floor) areas. Passengers move between levels on escalators and a lift located in a central courtyard void, which is graced by a waterfall and palms, and topped by a V-shaped rooflight. Parking, maintenance, services and baggage circulation areas are tucked away at semi-basement level.

Unusually for a modern airport, the departure area has an additional, scenic mezzanine perched within the soaring curve of the roof space, offering friends and relatives an unprecedented view of the airside departure area and the aircraft apron itself. Daylight access and external views are further facilitated by full-height glazed walls, both airside and landside, plus partial glazing on the other two walls – and a spectacularly curved, oversailing roof, punctuated by rooflights, directly derived from the sub-tropical roof-forms of Queensland architecture.

The white colorbond roof, with its deep, six-metre eaves to shade the window walls, is supported on expressed white-painted steel columns. These drive up through the lower floors before fanning out like branching trees. The arboreal references are further accentuated by the ubiquitous presence of real trees and palms, which constitute part of the extensive landscaping scheme throughout the upper floors. In addition there's an ambitious public art programme, funded by a statutory one per cent of the estimated total A$446 million bill.

One of the most important elements of the design brief was to make passenger circulation simple, whether arriving or departing. Signage is kept to a minimum and structural devices mark the passenger routes – most notably the series of yellow portals (shades of The Arch at La Défense in Paris?) with their shielded beacon lamps arrayed on the outer face, which announce the passport/security areas for outward passengers.

The brightness and visual clarity of the interior

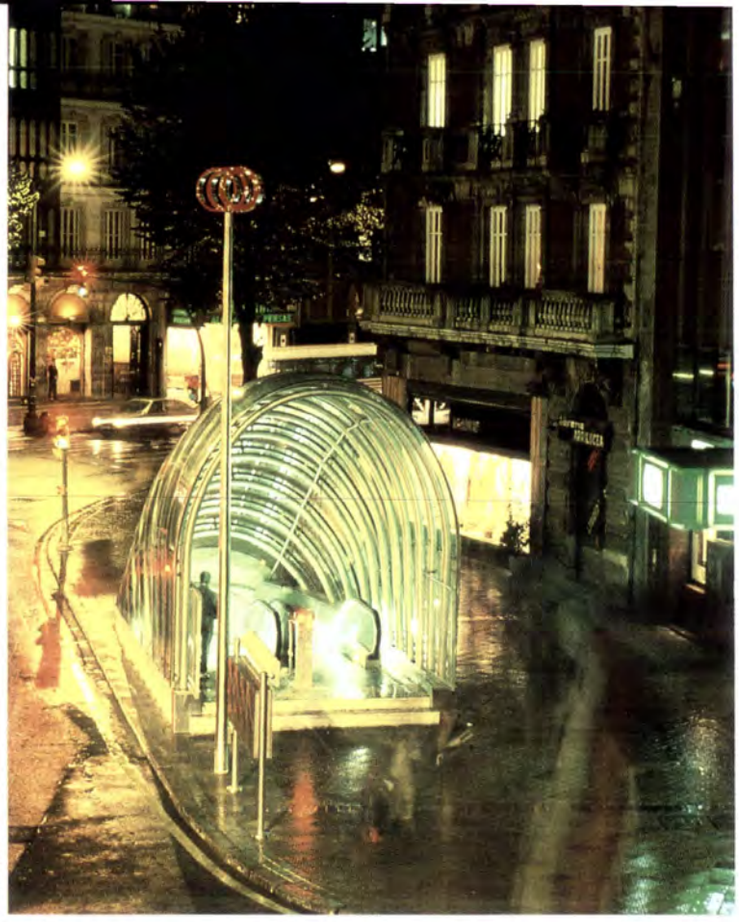


Above *View of the full height glazed walls and white colorbond roof, with six metre eaves – to protect the window walls from the harsh Queensland climate.*

would have been considerably diminished without the input of Britain's Lighting Design Partnership (LDP), whose integrated scheme included both artificial and daylight design. Two notable innovations stand out: the design of a clever adjustable reflector version of the iGuzzini Lingotto fitting to uplight the variable height roof evenly. The graceful metal halide luminaires (orginally designed by Renzo Piano), each with a different beam-spread, are mounted on stalks within the branches of the steel trees. Secondly the ingenious display of daylight control on the upper floor, which became a major sculptural element in its own right. Strong morning sun through the V-shaped skylight threatened considerable glare to the check-out desk VDT screens. LDP's solution is a series of attractive, triangular sails, in 20 percent light-transmissable fabric, suspended within the rooflight. These block direct sunlight while permitting largely uninterrupted views of the cloudless Queensland sky. **WA**

Project:	Brisbane International Airport
Client:	Federal Airports Corporation
Architect:	Bligh Voller Architects
Project Management:	Civil & Civic Pty Ltd.
Structural, Electrical and Mechanical Engineers:	Connell Wagner
Lighting Design:	Lighting Design Partnership

Above from top *Although absolutely modern, Brisbane Airport's new international terminal manages to be reassuringly legible and immediately recognisable. The Lighting Design Partnership developed a scheme to integrate both artificial and natural light; in order to light the variable height of the roof metal halide luminaries, each with different beam spread, were mounted on stalks within the branches of the "steel trees". Passenger circulation was an important element of the design brief; minimal signage was the chosen method – the yellow portals indicate passport/security areas for outward passengers*



Alfredo Aldai

John Edward Linden

Left *One of the "Fosteritos", the curved glass and steel entrances to nine of the eleven stations in the first phase of the Bilbao Metro Railway System.* ***Below*** *Interior view of a typical station showing the steel mezzanine suspended over the tracks by stainless steel tie bars*

Bilbao Metro Railway System

Bilbao, Spain

Architects Foster and Partners

Foster and Partners metro system, the Bilbao Metropolitan Railway, is the focus of the Basque government's substantial investment in the last three decades, in improving the regional infrastructure – as has happened in Barcelona. The recently completed metro links the coastal villages, industrial zone, city centre and suburbs, serving the one million population of Greater Bilbao, and connecting to an existing above-ground railway system. The dramatic street level glass enclosures are endearingly referred to as "Fosteritos" (for the smaller curved canopies), and "Fosterazos" (for the large canopy at Sarriko Station). The project has been constructed with many materials, and full cooperation from product suppliers and contractors, from the Basque country.

The system incorporates eleven stations in the first phase; nine are bored tunnels and two are cut and cover. The early design concept was to express the engineering of the station caverns. The rounded form of the interiors is defined by the method of engineering, and the exposed precast concrete panels, treated with transparent anti-graffiti coating, are a direct response to the structural needs. The tunnel forms of each station are a reflection of the most economical excavation for the necessary passenger flow.

Due to their site, and therefore the method of construction, the two cut and cover stations at San Ignacio and Sarriko are rectangular in form. In Sarriko the metro is positioned next to a large public space which allowed room for only one, larger, entrance. The mezzanine is constructed of steel reinforced concrete and straddles the platform and track bed below. Passengers enter the station either in glass lifts on the end wall or via two escalators suspended over the track and carrying passengers directly to mezzanine level.

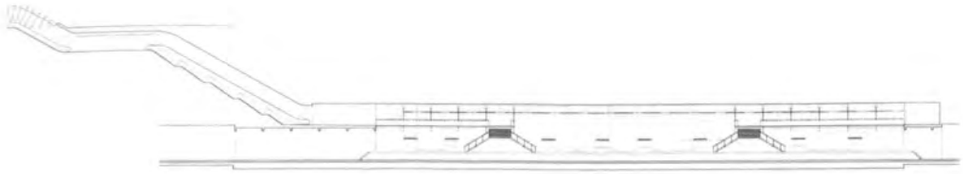
The excavation of the twin track system in the "cavern" stations enables all the key functions to be located inside the main station cavern. All services, including pump rooms, electrical stations and maintenance and station masters' offices are restricted to "plugs" at the ends of the cavern. The steel mezzanines are suspended by stainless steel hangers over the tracks, and are kept short to allow full appreciation of the volume of the space from platform level. In the cut and cover Sarriko station the precast concrete mezzanine hangs over much of the length of the tracks and is supported instead by concrete struts more in keeping with the impressive space with its heavy roof beams.

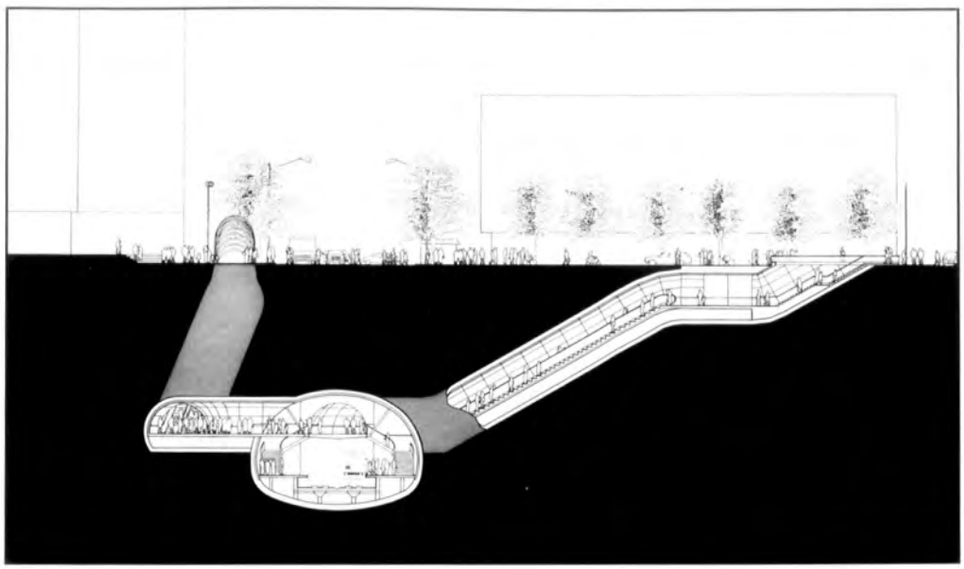
When completed the 29 kilometres of line will be served by 29 stations, 14 below ground and 15 above. **WA**

Project	Bilbao Metro Railway System
Client	Basque Government, Department of Transportation and Public Works, Vitoria
Architects	Foster and Partners; Norman Foster, David Nelson, Rodney Uren, Mary Bowman, Kevin Carrucan, Nigel Greenhill
Project coordination, engineering and construction management	IMEBISA, Bilbao
System planning infrastructure and engineering	Sener, Bilbao and TYPSA, Madrid

Consultants

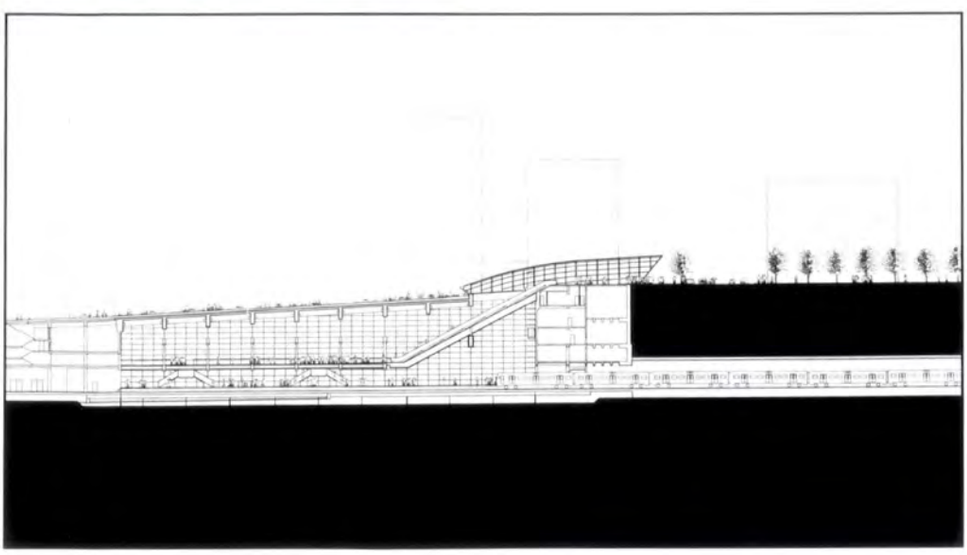
Concrete	Ove Arup & Partners Arup Design and Research
Tunnel Engineering	Mott, Hay, Anderson – London
Lighting	Claude Engle, Lighting, Washington DC (lighting products for phase 1: Targetti Sankey Spa, and Philips)
Signage	Otl Aicher, Germany Hans-Jorg Brücklacher
Quantity Surveyor	Davis Langdon & Everest
Civil Works Contractors	UTE Fomento-Balzola; Agomán; Dragados; Entrecanales; LAIN-Urruticoechea

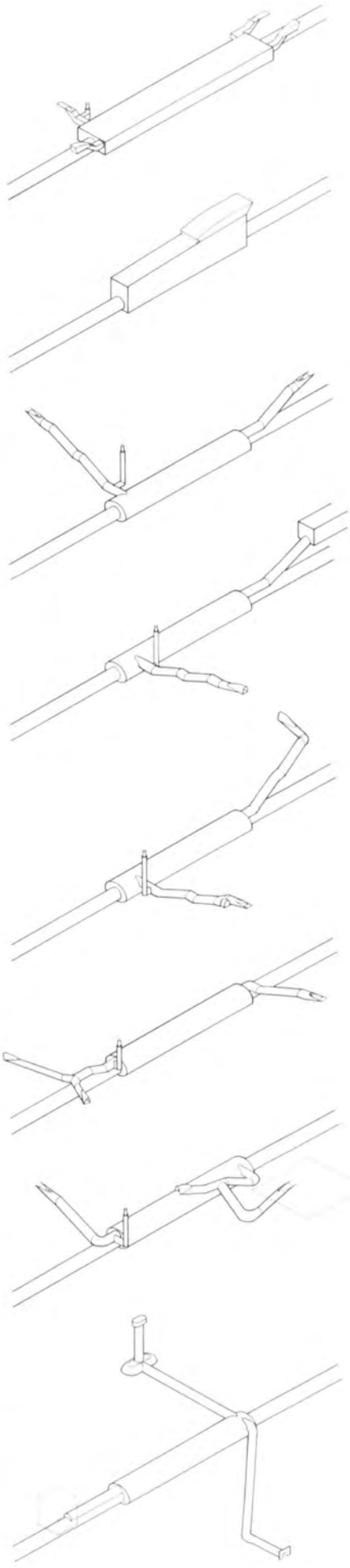




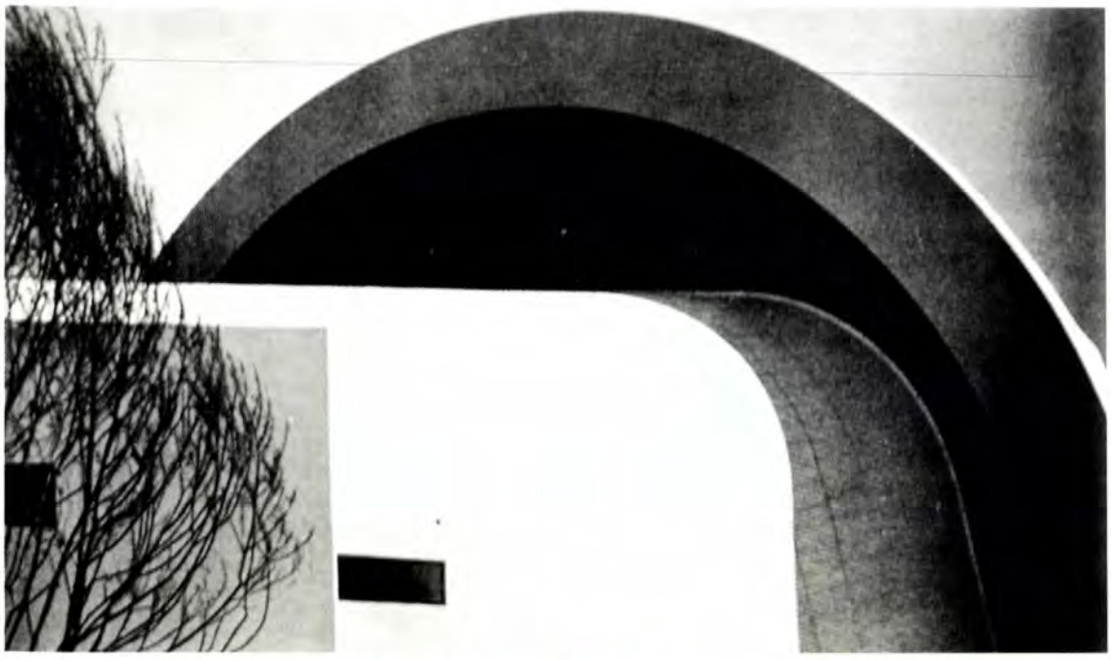
John Edward Linden

Top *Section of a typical station.* ***Above*** *Typical cross section showing the access tunnels.* ***Right*** *Different station layouts showing the Sarriko cut and cover station second from the top.* ***Left*** *Interior view.* ***Bottom*** *Sarriko station, long section*





Below left *Innovative use of aluminium sheeting 1939. Aviation Building at the New York World's Fair by architect William Lescaze.* ***Bottom*** *Panel assembly in the 1990s, the Aspect 2 Panel System developed by Brookes Stacey Randall Fursdon*



Cladding and roofing

Dr Alan Brookes tracks a century of cladding and roofing development and finds that, due to low investment in research and development and consistent failure to learn from precedents, there have been surprisingly few innovations over the years.

In 1902, H G Wells noted that "the erection of a house wall is an astonishingly tedious and complex business...I find it incredible that there will not be a sweeping revolution in the methods of building during the next century".

This prediction has been fulfilled, albeit in a curious manner. Although J A Brodie was building five storey blocks of flats in Liverpool, UK using concrete panels cast off site as early as 1905, further developments in cladding were slow to happen. A general dissatisfaction with the high rise blocks of the 1960s and 1970s accounts for the decline in the use of precast concrete over the last decade but its development through the inter- and post-war years was equally fragmented.

Composite metal panels, based on ideas by Jean Prouvé, were developed by Jan Sliwa for the Oxford Regional Hospital Board in the 1960s. Today, even though approximately 38 million square metres of foamed or laminated panels are produced within Europe, only a very small percentage of these are products which can match the sophistication of the original ORHB system, with its clamped edge detail and EPDM gaskets.

In June 1969, *Industrialised Building Systems and Components* magazine reported on the diamond shaped panels on the East Ham Working Men's Club, London, using 22 swg one metre square stainless steel, pressed and fixed with stainless steel brackets spot welded to their edges. Why were we then so surprised to see, over 20 years later, similar matt stainless steel panels supplied by Hendrichs Auffermann and used by James Stirling at the Braun Factory in Melsungen?

Recently there has been a re-emergence of interest in prefabricated brickwork and terracotta tiles used as rainscreen panels. Renzo Piano has shown the potential of terracotta at the IRCAM building in Paris, a constructional language he has repeated at the Cité Internationale de Lyon. Brookes Stacey Randall Fursdon has used the "Möding" terracotta tile system at The Churchill Centre in Rotterdam, and pre-stressed brick panels were specified by Bennetts Associates for the PowerGen headquarters building in Coventry. These, however, were not necessarily new ideas. Prefabricated brick panels were produced as early as 1934 on continuous production lines and during the post-war years, due to a shortage of skilled labour, houses were being erected by the "Smith's building system" using prefabricated panels of lightweight concrete faced with briquettes. By the mid 1960s, Redland Engineering were developing prefabricated brickwork panels and securing exclusive manufacturing rights for a brick casting system developed in the USA.

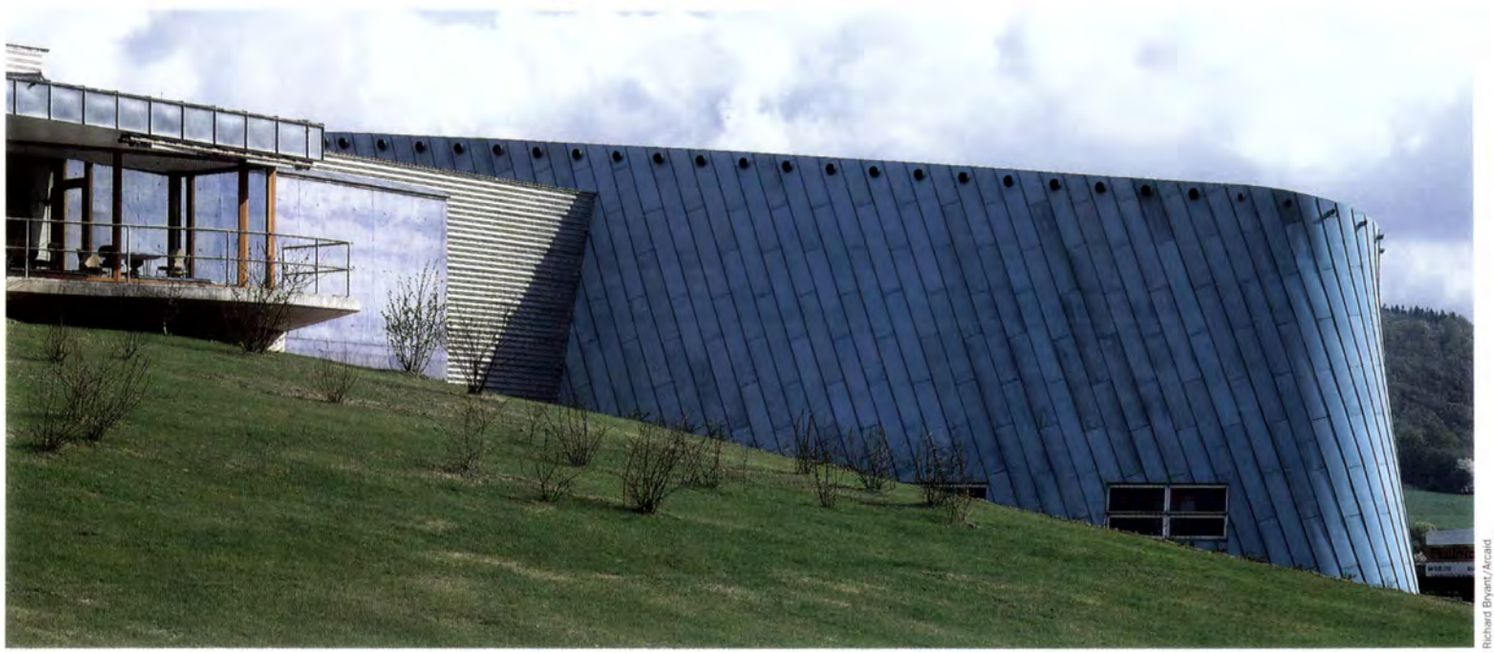
Toughened glass was used for the treads of the entrance stairs to the St Gobain pavilion, Paris Exhibition 1937. Foam glass was being used as roof insulation in the 1930s, but only now, fifty years later, are manufacturers of PVC roof membrane – such as Sarna and Trocal – seeking agreements with Pittsburgh Corning, manufacturers of foamglass, over the compatibility of their materials and in particular the adhesives, or bitumen bedding.

Clearly there were mistakes in the early formulations of glass reinforced plastics and cement. For example, as a result of a lack of understanding about thermal movement ultra violet light and microcracking lead to a loss of colour pigment. However, this does not explain why there has not been more continuous development of these materials, with their qualities of high formability and strength to weight ratio. ERC foam filled panels were used by Richard Rogers at the UP Fragrances, Tadworth in 1974, but this is an isolated incident.

Now these sectors of the industry have become more faint hearted and have generally moved away from the clear benefits of increased span and thermal performance which the use of foamed double-sided panels would have achieved.

British Steel has done well to pro-

Below *Innovative use of stainless steel and copper 1992. Braun Factory, Melsungen by architects Stirling Wilford.* ***Bottom*** *Curved steel roof sheeting, Archform by Ward Building. Systems for long span structures*

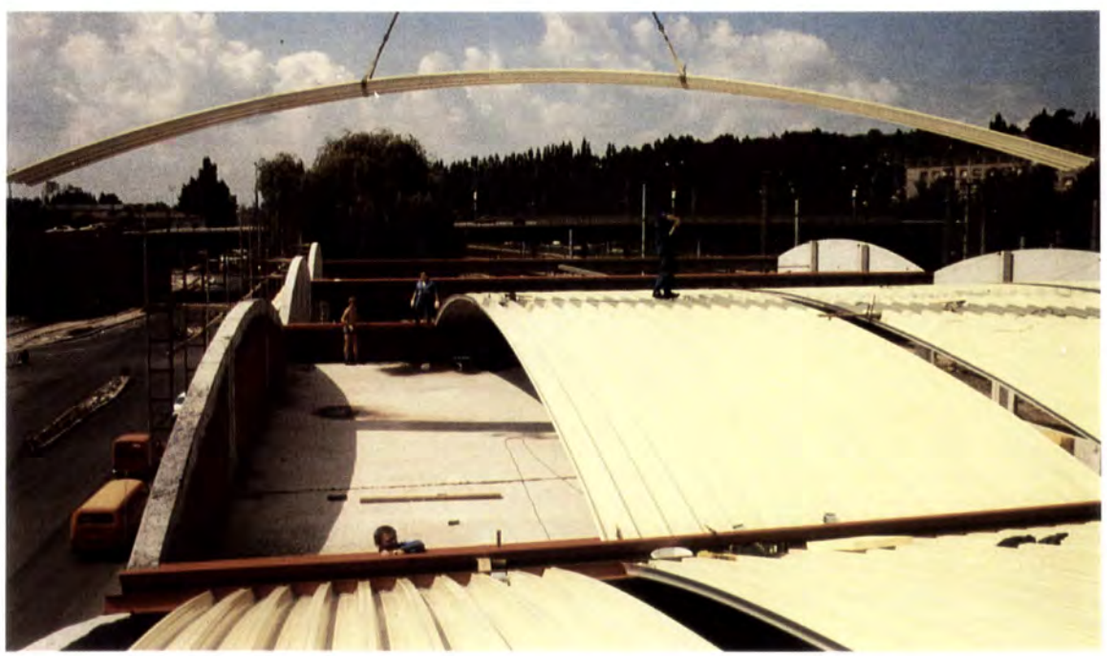


Richard Bryant/Arcaid

mote the use of PVF2 and Plasticol colourcoated steel for both profiled and flat sheets. Marketing initiatives, such as the Colorcoat Award and a competitive price structure have favoured the specification of profiled sheet and thin gauge steel, as used in composite panels. Aluminium has also gained its market share, though only in the thick rainscreen applications. It is therefore sad to look back at the refined application of aluminium, used as profiled sheeting on the Aviation Building at the New York World's Fair in 1939, applied to a curved form and variable geometry, which any supplier today would have difficulty in matching.

Manufacturers still need to explore the potential of arching or curved sheet materials in order to increase their spanning capacity and thus reduce the amount of supporting framework. Recent developments by Ward Building Systems with their licence for "Archform" show benefits over conventional profiled roof sheeting.

There have never been the same developments in cladding as there have been in glazing. This is partly because there has not been the same backing from manufacturers, and



partly because there has not been the same project innovation by architects and engineers such as Peter Rice, or technically qualified engineers within the cladding industry, as Ray Roberts in glazing. Systems of metal cladding such as AME Euro, Spanwall, and Aspect 2, have done well to sustain their place against competition from relatively low cost foamed composite cladding from H H Robertson, Wards and Composite Cladding Limited who have retrenched within their existing systems. Suppliers of the base materials such as British Steel and ICI Polyurethanes are too remote from the process of panel manufacturing to assume a development role.

Isaac Newton recommended that we should stand on the shoulders of giants. Taking account of hopelessly low investment in research and development, and consistent failure to learn from precedents, let us hope that future generations of cladding and roofing manufacturers will not stand on the shoulders of midgets. **WA**

Dr A J Brookes is a principal of Brookes Stacey Randall Fursdon, Architects and Technology Consultants

Keeping up appearances

In the image conscious nineties, even more importance is being placed on facades as the public face of a building. But they are also "intelligent walls" where technology such as infills, light-sensitive coatings, gels, automatic heating elements, insulants and interactive screens replace the more traditional "bricks and mortar". In a world where any one architect can no longer hope to be a walking encyclopaedia of building technology expertise, architect Andrew Hall has chosen to specialise in facades. He told Graham Vickers why he finds this advisory role so challenging.

In his role at Ove Arup & Partners' specialist group Arup Facade Engineering, Andrew Hall will identify his profession as that of "Architect/Cladding Designer". He is part of a young team comprising architects, product designers, structural engineers and services specialists.

"In general, I would prefer to describe myself as an architect" Hall says. "The term is good in that it covers everything. It's about combining the spirit, emotion and feeling of building design with the elegance and sophistication of engineering. Bringing those two together is what we do at Arup Facade Engineering. But I'm also interested in design in the broadest sense. I think you learn to take an holistic view of things in architectural training."

Hall gained his own architectural training first in his native Newcastle, then in London at the Bartlett, University College. Now, at 33 and enjoying the unique combination of freedom and rigour that Arup's can provide, he retains a youthful enthusiasm for abstracts and ideals which seems to have been enhanced rather than dimmed by a decade of demanding and often high profile professional work. This was dominated by a six-year stint as a senior architect with Nicholas Grimshaw & Partners where he designed many bespoke cladding systems.

"The reason I got into facades is because it's where everything comes together" he says. "It can be such a powerful statement. The traditional idea of facades and cladding has changed. We are not guys just trying to keep water out of a building, we want to get in as early as possible to integrate the facade into the 3-D volume. We're interested in how the facade and other elements of the building interact with one another".

Hall was able to explore such issues from the vantage point of a working architect when employed by Grimshaw on such projects as Sainsbury's Development in Camden, London, the UK Pavilion at Seville's Expo '92, and the Berlin Stock Exchange.

"For the Stock Exchange we took a set of glass louvres that began the day by forming a vertical plane – a sheer glass facade – and then gradually opened up to form a textured and modelled facade that had distinctive qualities of light and shade."

This is the kind of problem that Hall enjoys solving. Although he will sometimes identify the brave new world of facades in terms of the intelligent wall, with its largely unfulfilled technological promise of coatings, infills, gels, heating elements, insulants and other reactive elements, his real preoccupations lie in the technology of the present where his broad-based interest in the arts and popular culture often suggest to him unexpected ways of looking at matters structural.

"Inspiration can be drawn from a contemporary dance performance, stage sets or even looking at food on a plate" he maintains. "I like all creative processes – cooking is just another example of bringing a set of components together to create a result that can be attractive and surprising. My aim would be to remove the seriousness of some engineering attitudes and try and move the engineering much closer towards lifting the spirits. There are very few engineering structures that are so elegant that they move you."

Curmudgeons and clients may argue that before catering for the spirit you do need to keep the rain out, and the point is not lost on Hall, who has frequently worked with the redoubtably pragmatic Sean Billings, himself a member of the Arup Facade team. Their current involvement with Michael Wilford & Associates on the proposed seven acre roof for the Abando Rail Interchange, Bilbao, seeks elegance primarily through economy.

"What's needed first and foremost there is an umbrella" Hall says. "So the application of curtain-walling systems, air and vapour seals and other leading-edge technological solutions are all totally irrelevant. The question is 'how can I keep the cost down whilst limiting myself to solving the problem I'm asked to solve?'"

The move from Grimshaw to Arup Facade Engineering may have been something of a professional trade-off, but he stresses the positive aspects.

"It was good schooling at Grimshaw's" he says, "but what's nice now is that here I enjoy a much wider view of architectural practices than would be possible if I was working within the single stylistic idiom that you might get at any one architectural practice. Here I can work with many architects who have a variety of approaches".

Although Arup's facades team rarely leads projects, it has an increasingly influential role to play that reflects the growing importance of facades and cladding in the architectural mix.

"The merging between architecture and engineering remains somewhat

Clockwise from the top *Abando Interchange, Bilbao by Michael Wilford and Partners; end elevation of station with glazed restaurant structure in foreground. Yapi Credi Bank, Istanbul; model shot of street glazing and stairtower. British Airways, Centre for Combined Operations, Heathrow, London; glass solar control louvres in cast aluminium. British pavilion, Expo '92, Seville by Nicholas Grimshaw and Partners; suspended glass water wall*

vague" Halls says, citing the proposed roof for St Pancras (a current Arup project and part of the London/Continental railway bid) as a case in point.

"The question arises 'how much is it engineering, how much architecture?' We're trying to bridge the gap between the industry, which is very specialised, and architects who don't have a specialism."

Certainly Arup Facade Engineering has been involved in a broad spread of projects, including work on the Yapi Kredi Bank, Istanbul, the Royal Opera House, London and the new Parliament building, London. Glaxo World Headquarters is currently in progress, featuring a thermal flue facade with a triple-glazed skin.

"There we've done a lot of thermal analysis and research into how the facade reacts to the wind" Hall says, "but also we've had to deal with the nitty gritty nuts-and-bolts side of the solution".

Hall admires the creative pluralism of Renzo Piano and even finds valuable lessons in Issey Miyake's holistic approach to designing clothes. He resists the blinkered views of some refugee cladding consultants coming from "declining British curtain walling companies" who set themselves up as one-man bands. Most of all he relishes "the wide range of very focused specialists at Arup's", where a chance conversation in the corridor may yield state-of-the-art answers in a world where any one architect can no longer hope to be a walking encyclopaedia of building technology expertise.

"The more I've looked into the specialist areas, the more I've found how little I know and how frightening my position was as an architect. But here you can go down to the minutiae and understand the precise details of how things go together. It's a very good place to be a bit of a spy within the camp – an architect in a massive engineering organisation." **WA**

MCC Indoor Cricket School, Lord's Cricket Ground, London, UK

The new Indoor Cricket School at Lord's is the latest example of high quality contemporary architecture to occupy this central London site. Other commissions by the architecturally conscious Marylebone Cricket Club (MCC) include Michael Hopkins' Mound stand and the scheme for a new 6000 seat Grandstand by Nicholas Grimshaw.

The new building, designed by David Morley Architects, replaces the old indoor school, since demolished, which was housed in a dingy old shed lit by glaring artificial light. The brief from the MCC was to provide a new state-of-the-art facility, with better training facilities, spectator areas, back up facilities and an increased number of playing lanes.

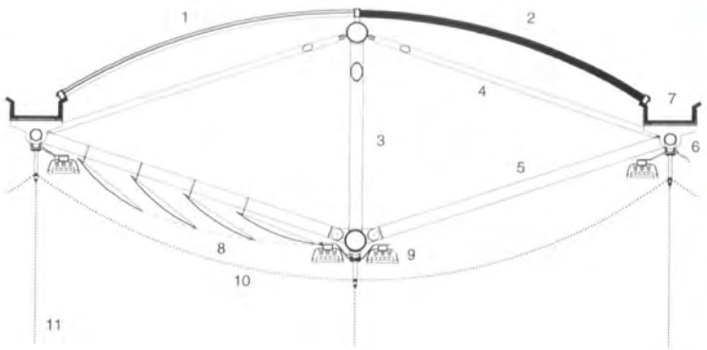
Morley has responded with a simple yet practical building which has been oriented to take full advantage of the chosen site. All facilities and support accommodation have been neatly housed in a three-storey double-sided pavilion, with spectator galleries and outdoor terraces providing spectators with views over both the indoor playing area and the adjacent nursery ground outside. From the outset, the architects homed in on two main factors – the quality of the playing surface and the quality of light. Amidst all the traditional cricket school objections to natural daylight, as being too variable, the architects opted for a naturally lit building which would both save energy and provide a more pleasing playing environment. Following extensive research and tests in daylight laboratories, the client was finally convinced.

The design of the roof, which runs the length of the playing area, is the key to the design. Based on the north light roof concept, traditionally used in industrial buildings, the architects have softened the form using a combination of half-glazed barrel vaults and fabric louvres to cut out the variable direct sunlight from the south. The result is that only diffuse, even light from the northern part of the sky is admitted

achieving a light level in excess of 2,000 lux in daylight hours. Each roof bay covers two playing lanes, with the structure used to support both protective ceiling netting and retractable vertical nets. Purpose-made fluorescent light fittings integrated into the tracks along the line of the nets provide illumination after sunset. In keeping with the sport everything is white, from the painted steelwork to the fabric louvres.

The final architectural masterstroke to this naturally lit interior is the addition of full height sliding side walls which can be opened up in summertime to let in fresh air and further assist in bring this traditional summer outdoor game inside. **WA**

Opposite page top *The roof runs the length of the playing area.* ***Opposite bottom*** *The north-west elevation with spectator terraces overlooking the Nursery ground in the foreground.* ***Below*** *Detail of roof construction showing half-glazed barrel vault and fabric louvres*

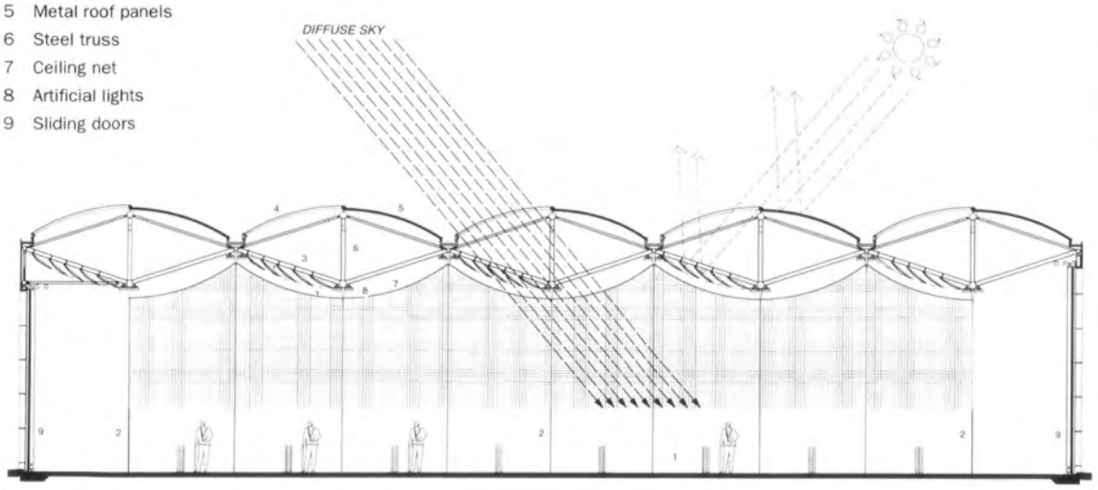


Typical roof detail

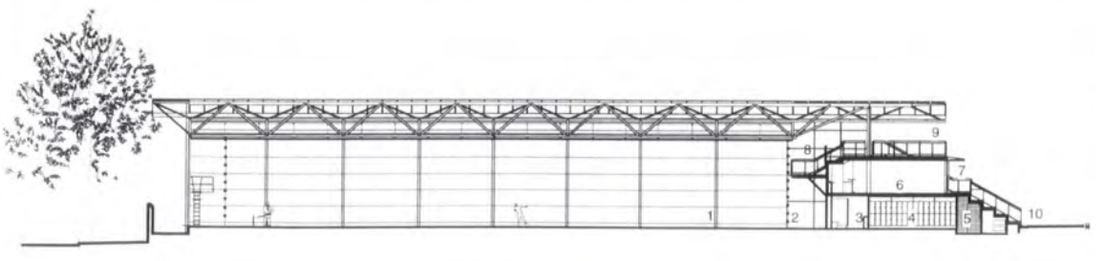
1 Double glazed rooflight in clear Lexan Excell polycarbonate
2 Double skin polyester coated aluminium with EHD insulation
3 Steel truss - 244.5 dia x 6.3/12.5 CHS top and bottom chords
4 76.1 dia x 5.0 CHS
5 139.7 dia x 10.0 CHS
6 139.7 dia x 10.0 CHS with brackets to support cold formed purlins
7 Fully welded mill finished aluminium insulated gutter and maintenance walkway
8 Fabric louvres with battens and 2mm bracing wire clipped to 5mm galvanised tension cable
9 Purpose made fluorescent light fittings
10 Ceiling netting
11 Retractable hanging nets

Cross Section through playing area

1 Playing area
2 Retractable tension nets
3 Roof blinds
4 Rooflight
5 Metal roof panels
6 Steel truss
7 Ceiling net
8 Artificial lights
9 Sliding doors



Client	Marylebone Cricket Club
Architect	David Morley Architects
Structural Engineer	Price & Myers
Building Services & Lighting Engineers	Max Fordham & Partners
Quantity Surveyor	Davis Langdon & Everest
Lighting Adviser	George Sexton Associates
Landscape Architect	Edward Hutchison Landscape Architects
Photographer	Dennis Gilbert



Long section

1 Playing area
2 Tension net and sight screen
3 WCs
4 Changing rooms
5 Showers
6 Bar/Coaches' rooms
7 Terrace
8 Spectator gallery
9 Upper terrace
10 Promenade

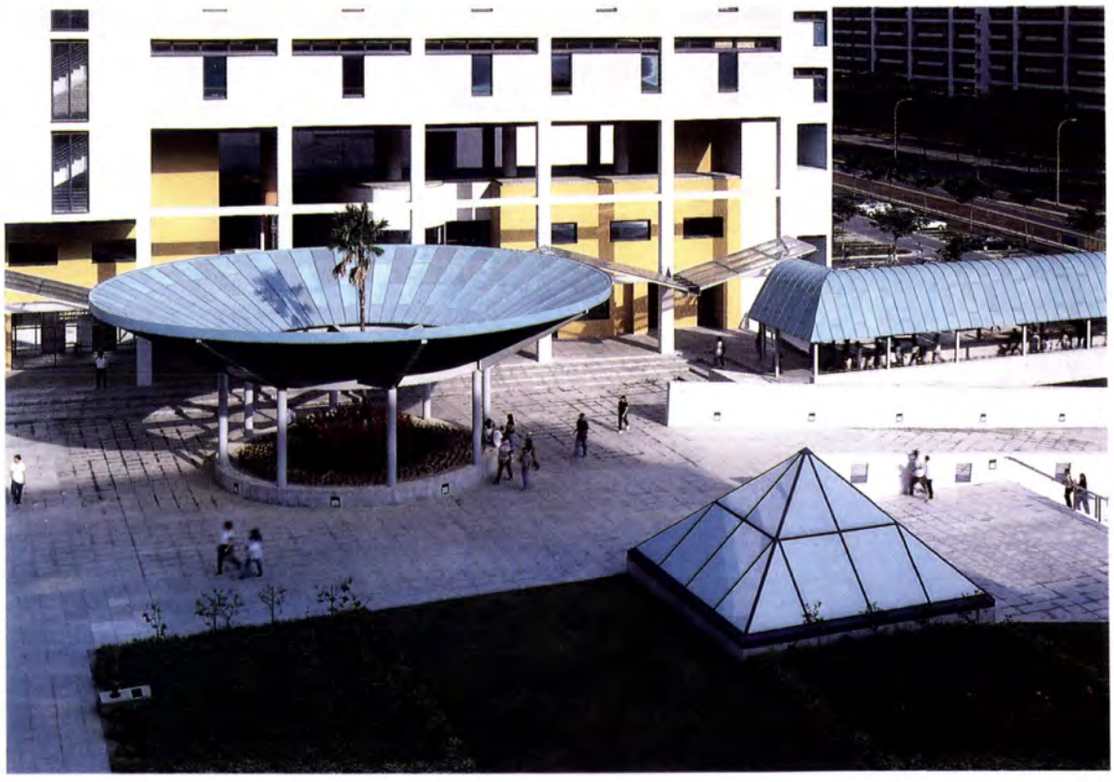
Temasek Polytechnic, Singapore

From a distance the most striking feature on the site of James Stirling Wilford Associates' new Temasek Polytechnic in Singapore is the patinated copper roof, which functions as a visual link across this vast project. Following the successful use of this material in their scheme for the Braun factory in Melsungen, the architects once again opted for copper – in preference to aluminium or corrugated sheet – as an alternative roofing material. Perhaps not surprisingly, they have also used the same supplier, KM Europa Metal, and the same product, TECU®-Patina "pre-weathered" copper sheets.

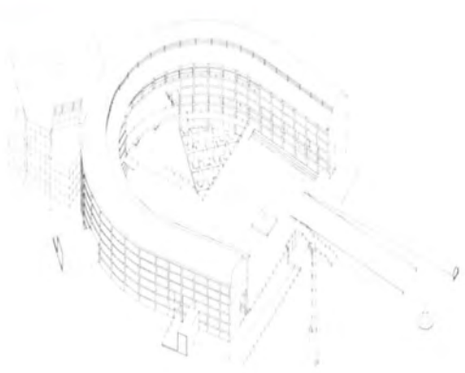
Copper roofing is often seen as an upmarket "premium" alternative and, with the limited budget for this project, the client did take some convincing. But the longer term benefits of copper, such as durability and corrosion resistance, more than justify the initial expense. The TECU®-Patina copper sheets are treated in the factory using a special process which immediately gives it the distinctive green patina, usually developed by natural weathering over a number of years. This process negates any possibility of uneven or irregular patination on site, and provides a material which can also be used on vertical areas or soffits which would not otherwise patinate from rainwater. If damage occurs during installation, the marks or scratches will "heal" naturally with continued exposure to the weather. Once installed it requires no surface maintenance or cleaning.

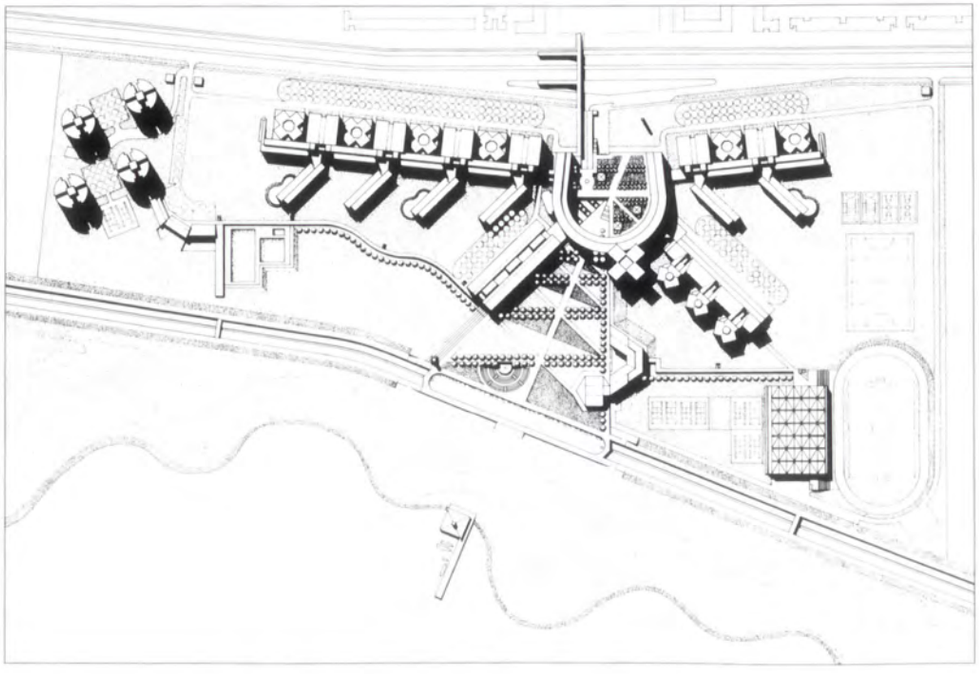
The use of colour is an all-important part of this project. The architects specified a pale lilac finish for the buildings (glaring white was not an option in this hot climate) accentuated by bold splashes of colour on the internal columns, colour coded for each school. The bright blue soffit to the covered walkways links the buildings together. The green pre-patinated copper canopies over the outdoor student canteens successfully serve to merge the buildings into the landscape. **WA**

A full feature on the Stirling Wilford Temasek Polytechnic will be featured in the next issue's Special Report on education buildings.



Architects	James Stirling, Michael Wilford and Associates (London) in association with DP Architects Pte (Singapore)
Client	Temasek Polytechnic
Project Management	Public Works Department, Singapore
Structural, M&E Engineers (UK)	Ove Arup and Partners International
Structural Engineer (Singapore)	Ove Arup and Partners
M & E Engineer (Singapore)	PCR Engineers
Roofing	K M Europa Metal AG
Photographs	Richard Bryant/Arcaid





Opposite from above *Aerial view of the patinated copper roof supplied by KM Europa Metal using TECU®-Patina "pre-weathered" copper sheets; behind the circular porte- cochère are the angles of the glazed porch and the yellow brick arcade.* ***From above*** *Administration building and Library; axonometric.* ***Right*** *Block plan of Temasek Polytechnic site*

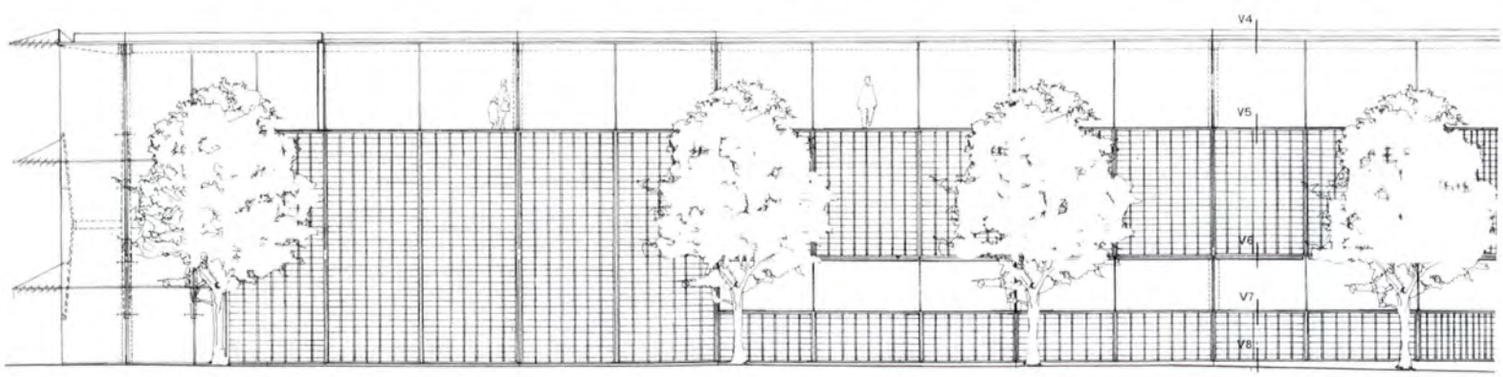
The Churchill Centre, Rotterdam, The Netherlands

A run down retail development in the heart of Rotterdam has been given a new identity by London practice, Brookes Stacey Randall Fursdon (BSRF). Formerly known as "De Veste", The Churchill Centre was built in the late seventies and occupies a prime site above the intersection of the two main Metro lines. However, because of a number of problems due to the internal layout, the retail units had become virtually unlettable.

The overall form of the original buildings was a plan of interlocking octagons with inter-connecting covered pedestrian walkways on two levels. Its stepped outline and the use of different materials in small areas made it difficult to navigate, with shop windows separated from shoppers by the pedestrian walkways. To access these, users had to negotiate a series of dark and uninviting narrow steps. Apart from a plethora of competing signage, there were little external indications of the shops and restaurants within.

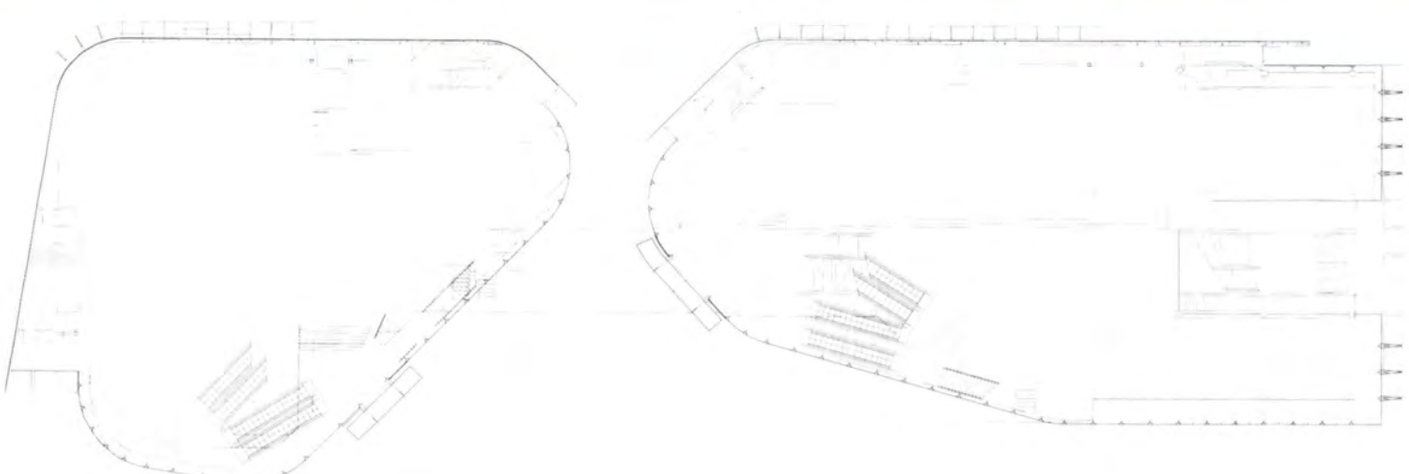
BSRF have addressed these fundamental concerns by simplifying the overall form of the development. Pedestrian walkways have been removed and entrances to the shops have been inserted at ground level with glazed canopies overhead. Full height glazing has been installed on the pedestrianised side providing clear visibility to the shop windows, while around the sides and rear, a terracotta wall shields the development from the busy Coolsingel Road. Existing escape stairs provide a visual distinction between these two contrasting materials.

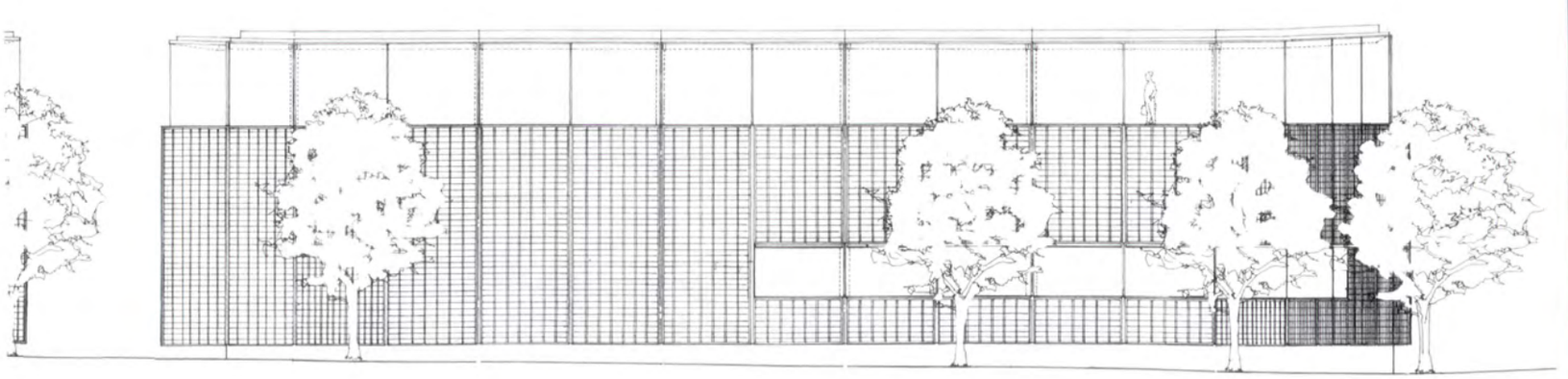
The curved terracotta wall gives the new development a strong visual identity. The construction uses a steel frame assembly, used to prop the new lightweight perimeter floor decking onto which is mounted a framework of panels, back-up wall with vapour barrier insulation and internal lining. Benefits in this type of assembly include providing perimeter framing to the floor and in reducing loads on to the existing foundations and ground floor slab. The facing material is a 400 millimetre extruded terracotta coloured ceramic tile from German manufacturer Möding which is faceted around the building to produce the curve. It is easily maintained due to the small size of each unit and should it become damaged, is easily replaceable without disturbance to the insulation, framing and internal lining. **WA**



Opposite page and below *Details of glazing, canopies and terracotta tile cladding.* ***Below centre*** *Outline plan of new scheme overlaying original sharp angled building plan showing escape stairs, internal access and canopies over entrances.* ***Bottom*** *Elevation*

Client	Maasstede Vastgoed, Rotterdam
Architects	Brookes Stacey Randall Fursdon, London in association with Pim Van der Ven Architecten, Rotterdam
Contractor	Slavenburg's Bouwbedrijven, Rotterdam





University of Lincolnshire & Humberside, Lincoln, UK

Client	University of Lincolnshire & Humberside
Architects, Structural Engineers	
Mechanical Engineers, Landscape Architects	RMJM (London) Limited
Main Contractor	Balfour Beatty Construction Limited
Cladding Subcontractor	Dane Architectural Systems Limited

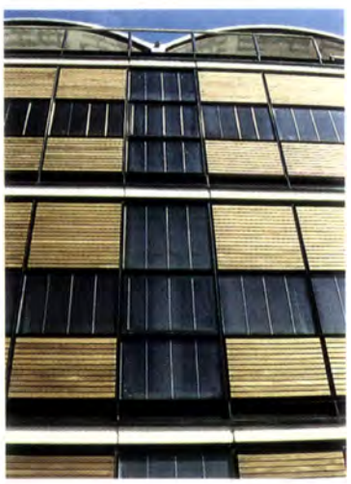
The University of Lincolnshire & Humberside, designed by London-based architects RMJM, is the first new university to be constructed in the UK for 25 years. It is sited in a tranquil location to the south of Lincoln city centre.

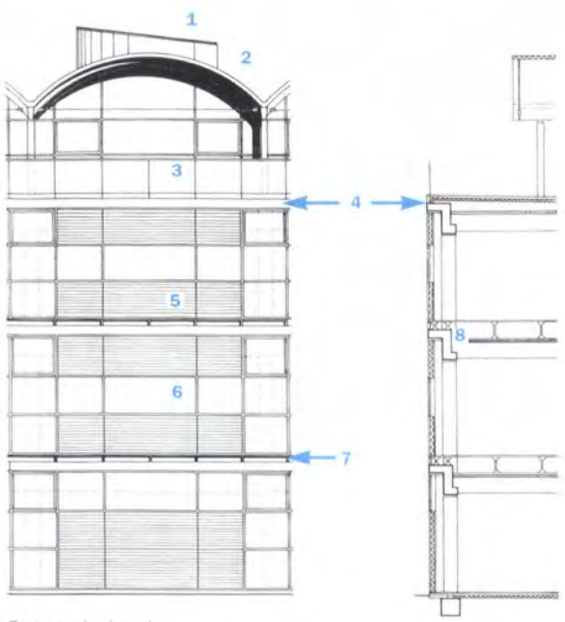
This first phase of the development, bounded by railway lines on one side and the Brayford pool on the other, comprises a series of standard clear span modules separated by vertical service cores. These flank a full height central street which runs the length of the building. In five of these modules academic space is accommodated on four floors , with a three storey high central area created in the sixth. This acts as the social heart of the complex housing a meeting area, restaurant and exhibition space, which opens out onto a terrace and deck at the water's edge.

The majority of the building envelope is clad using a framed curtain walling system manufactured by Schüco, containing a combination of glazed and solid infill panels which respond to the building's aspect and orientation. The north facade is heavily glazed, using both transparent and translucent glass, and takes advantage of the views over the boating pool towards Lincoln Cathedral. In contrast, the south facade with its problems of heat gain and noise from the railway line, has been designed to provide maximum acoustic insulation through a series of solid infill panels interspersed with a central band of clear glazing. The solid panels have been constructed from Iroko timber boarding externally, acting as a rainscreen, with a highly insulated steel faced composite panel internally. The clear double glazed units are fitted with fixed internal blinds to further reduce heat gain and prevent glare.

In all instances the framed curtain walling system is set between the precast concrete perimeter edge beams, with the edge of the concrete expressed externally. The junction between curtain walling and precast concrete is made up with a preformed channel section.

The timber and glass panels continue around the east and west facades, giving the building a sense of softness and allowing it to settle into the peaceful surroundings. WA

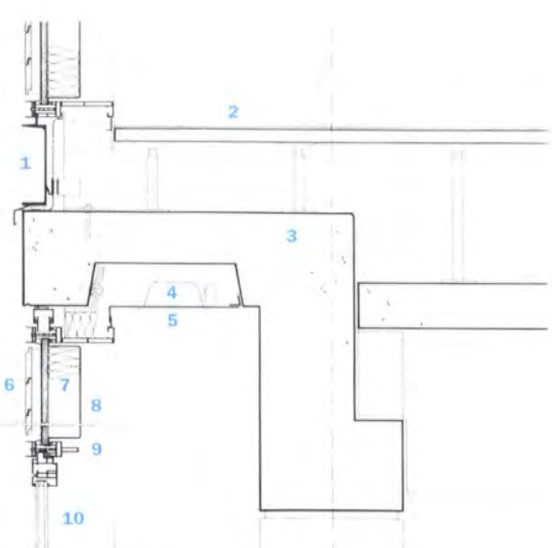




Part south elevation

Part south elevation – Key

1 Rooflight
2 Zinc sheet barrel-vaulted roof
3 Balustrade with glazed infill
4 Pre-cast edge beam
5 Iroko panel
6 Clear glazing with fixed intersit blind
7 Perimeter channel section
8 See cladding section detail below



Cladding section detail

Curtain walling

Schüco FW50S sections
Solid cladding panels: Iroko faced shiplap boarding timber supplied by Golding & Ansel Joinery Limited
Clear double glazed units with low E coated glazing and argon filled cavities

Cladding section detail – Key

1 Perimeter channel section
2 Raised floor
3 Pre-cast concrete edge beam
4 Light fitting set into soffit
5 Aluminium soffit
6 Iroko shiplap boarding on timber battens
7 Insulation
8 Steel inner panel
9 Schuco transom section
10 Double glazing

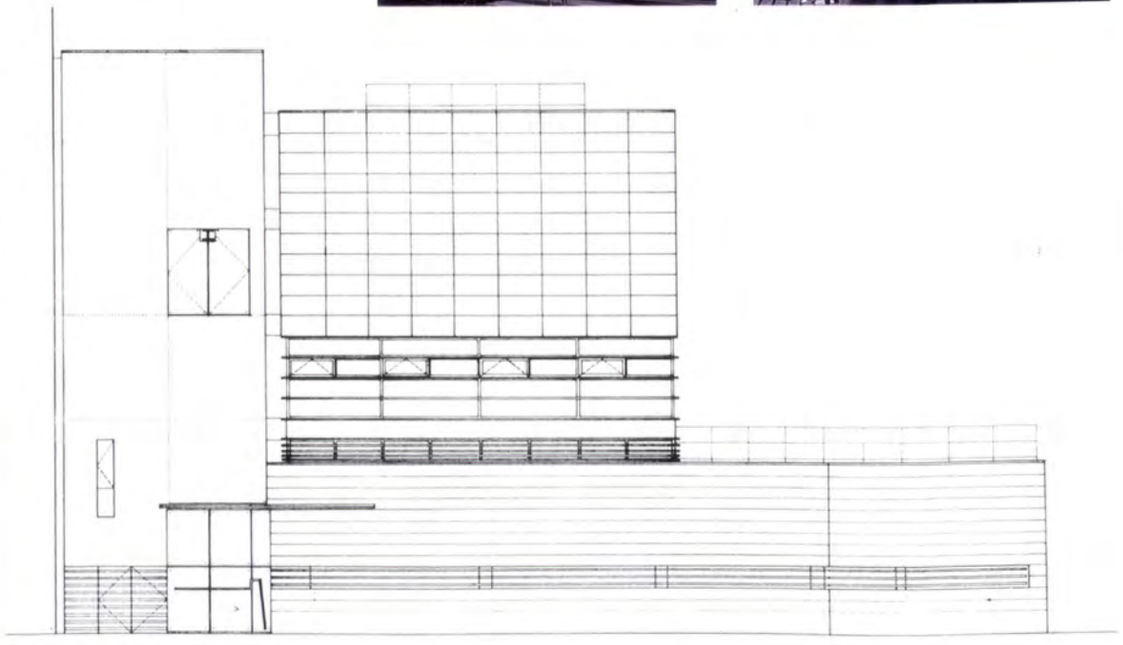
Department of Mechanical and Manufacturing Engineering, Trinity College, Dublin, Republic of Ireland

The new department of mechanical and manufacturing engineering at Trinity College, Dublin, is the first building to be completed in a new phase of work being undertaken at this historic campus. Designed by local practice Grafton Architects, the new facility is a stylistic extension to the old eighteenth-century Parsons building, providing an engineering workshop, laboratories, offices and seminar rooms.

Externally, the new extension is a bold form accentuated by the choice of materials and the restrained use of glazing. The dominant element is a formal cube, clad in open jointed black basalt lava punctuated on the north and south elevations by long slim windows. This sits on an irregular shaped podium or basement level clad in sand blasted Wicklow granite and separated from the dark, rich texture of the cube by a band of glazing. Both these materials were supplied by Stone Developments. The podium level houses the workshop space lit from above by triangular rooflights, which echo the rhythm of the windows in the adjacent Parsons building. This area also serves as an exterior forecourt space to the main door in the Parsons building with access via a stepped ramp. Entrance is gained to the new building via a second glazed doorway.

The cube houses the laboratory and the academic offices, with seminar rooms and further office space sited in an adjacent taller structure finished in a soft polished plaster. This second block successfully mediates between the scale and form of the cube and a new Dental School to the east, designed by Ahrends Burton and Koralek and currently on site. It also connects directly to the Parsons building which houses the rest of the Department. **WA**

Client	Trinity College, Dublin
Architect	Grafton Architects
Contractor	John Paul Construction
Consultant Engineer	Ove Arup Ireland
M&E	Homan & O'Brien Consulting Engineers
Photographs	Dennis Gilbert



North elevation

Below left *World Headquarters, International Association of Machinists & Aerospace Workers, Upper Marlboro, Maryland. Architect: Al/Boggs/Washington.* ***Below*** *Taipei Formosa Building, Taiwan. C. J. Chen Architects Taipei*

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There is no doubt that creativity and style are the most desirable characteristics of modern architecture. But what is the point of producing a prestigious, stylish building when the exterior weathers away after a few years? One of the principle qualities that both architects and building owners require of exterior coatings is that it will look the same in 20 or 30 years as it does today.

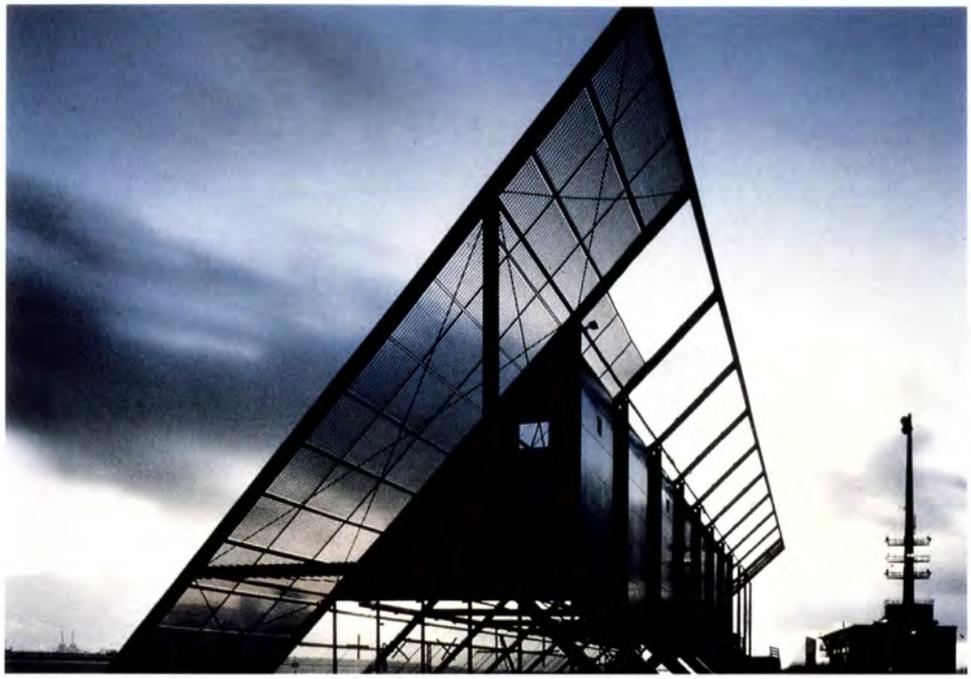
Despite continuous research and technological innovation in the field of organic coating chemistry over the past three decades, there are few exterior paint systems which can rely on 20 or more years of proven performance. Few paints resist 20 years of out-door weathering, including UV-light, with minimal change in appearance, such as gloss, colour and chalk. Few exterior coatings have accumulated such impressive proof of performance based on actual real life of both industrial and residential buildings. This article will take a closer look at the types of exterior coatings which are able to maintain their gloss and colour over 20 years, despite aggressive environmental conditions.

Leaving detailed paint chemistry aside, one may say that, fundamentally, paint consists of colour pigments (mineral or organic), an organic polymer binding material to hold the paint together, solvents and small amounts of additives, which have specific functions in the paint.

When it comes to the combination of long life performance and exterior coatings, polymer binders have long been a critical ingredient of durable exterior coatings. Of all polymers known today those based on fluorine chemistry have an unrivalled resistance to chemicals, as well as added thermal and mechanical properties. This unparalleled combination of characteristics is derived from its intrinsic chemical nature: the carbon- fluorine bond.

Fluorine atoms have such a tremendous affinity for the carbon atom that the energy required to break such a bond is much higher than that of any other (470 kJ/mole). This is one reason why it is so difficult to destroy fluoropolymers in general. Even when they are exposed to high energy UV-light for long periods (corresponding to the sunlight spectrum of

Below *Pavillion Hoaek van Holland, Netherlands. Architect Cepezed BVs Delft.* ***Bottom*** *Centro per le Tecnologie Informatiche e la Communicaziono, Piata, Italy. Architect Raffeale Troncone*



350 nanometers or less), fluoropolymers do not show any sign of degradation. Other polymers show embrittlement, which, when used in a paint, leads to premature cracking of the coat.

Polyvinylidenefluoride (Hylar 5000) is a fluoropolymer which has accumulated 30 years of experience in both accelerated laboratory testing and material exposure to the Florida climate.

F.ex laboratory exposures to UV-A/B spectra for over 5000 hours have hardly any effect on panels coated with PVDF-based paint. Thousands of coated panels have been subjected to natural outdoor exposure in Florida (at an angle of 45°, facing south) for over 25 years without any notable change in gloss or colour and chalk.

PVDF based paints comply with American standards applicable to exterior coating, as described under AAMA (American Architectural Manufacturer's Association) 605.2. This is the most stringent specification for exterior organic coatings, whereby gloss variation may not exceed 50 percent and a colour variation of more than 5ΔE (Hunter or Cielab) percent after five years of continuous Florida exposure at 45° facing south.

PVDF based liquid paints are applied by coil-coating on wide rolls of thin sheet coils of fine metal (galvanised steel or aluminium). These coated coils are cut to panel size and progressively cold-formed into end products such as curtain walls, metal roofing or other shapes. PVDF based paints are also used for spray coating metal shapes, such as f.ex window frames. Both coil-and spray coating requires an oven sintering process in order to achieve the proper film formation and adequate adhesion to the respective substrates.

One additional property of PVDF coatings is its mechanical flexibility which allows bending and formation of the metal sub-strate without cracking the coating. In fact PVDF coatings are sufficiently flexible to pass the T-bend test.

In terms of chemical resistance, PVDF coatings provide remarkable resistance to staining, cleaning agents, solvents, mortar as well as airborne pollutants.

Furthermore, a wide selection of lively colours (including metallic and even pearlescent) are complimentary tools which permit architects to fully express themselves. When using PVDF, the architect and designer can rely on the fact that the lively combination of colours used in his/her project will be sustained for 20 years and beyond.

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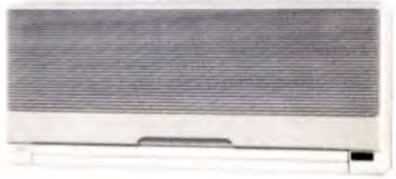
New models

Cassette unit

Ceiling mounted



Wall mounted

Window mounted

Floor mounted

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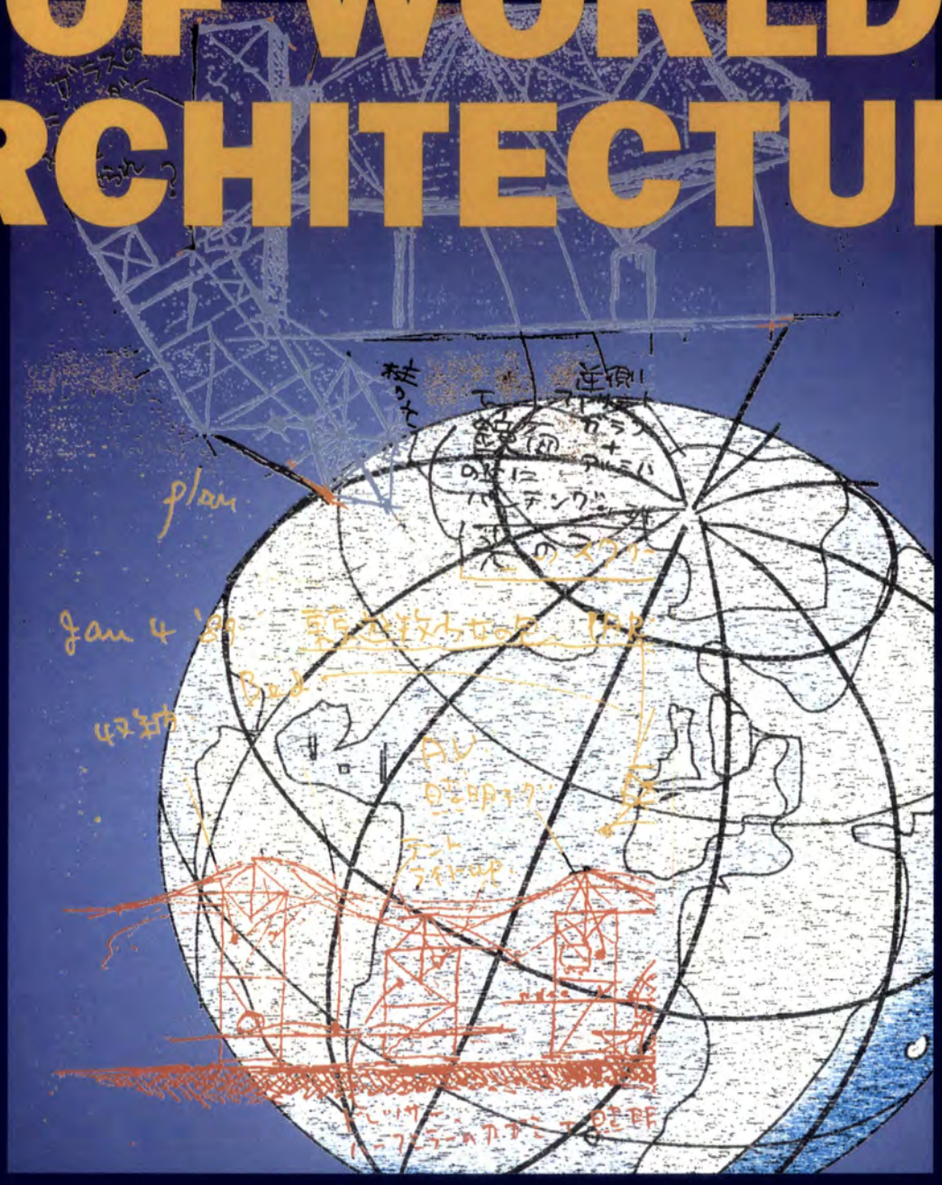
THE GIANTS OF WORLD ARCHITECTURE



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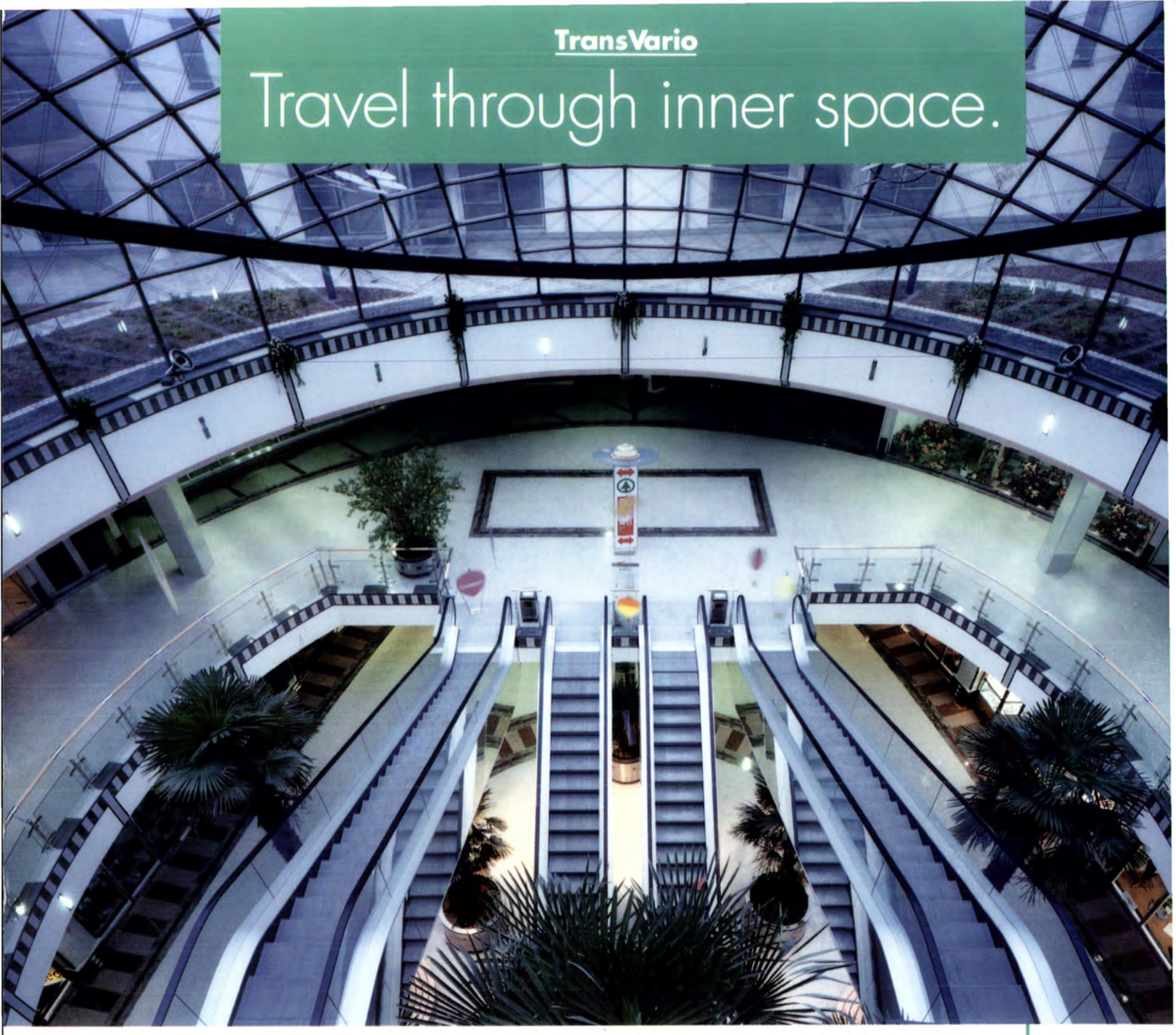

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