WORLD ARCHITECTURE

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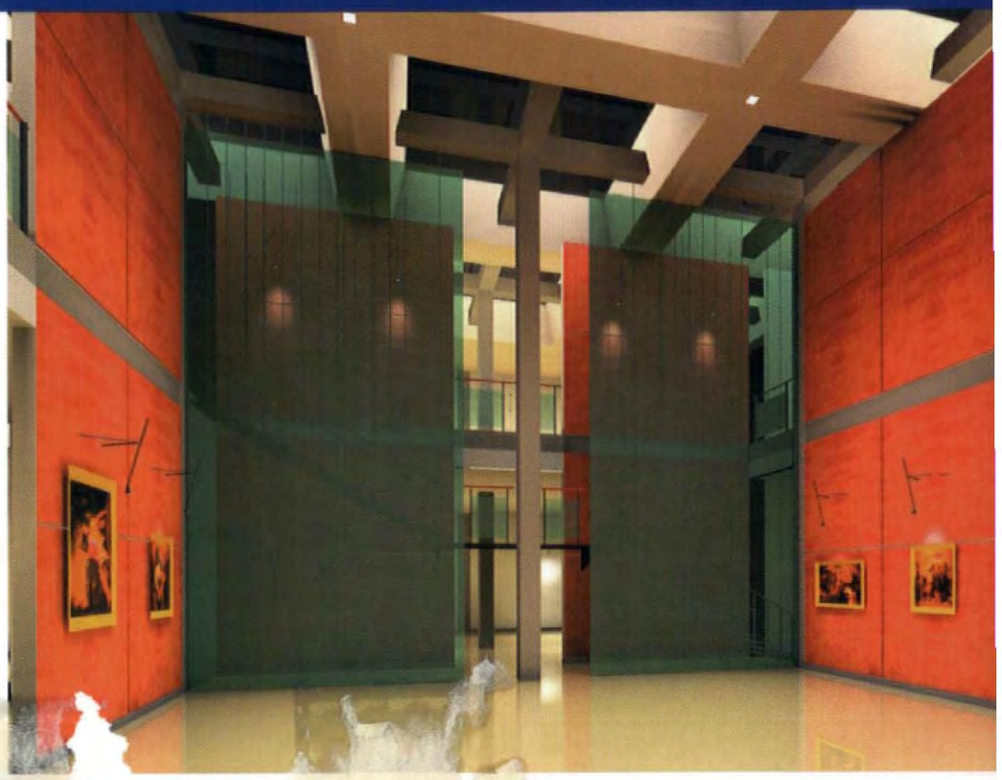

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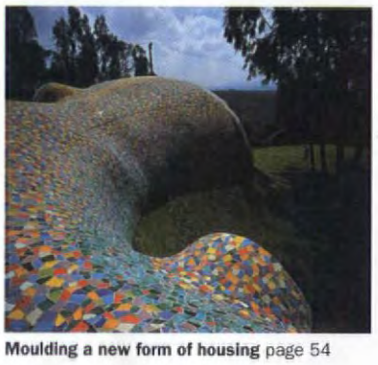

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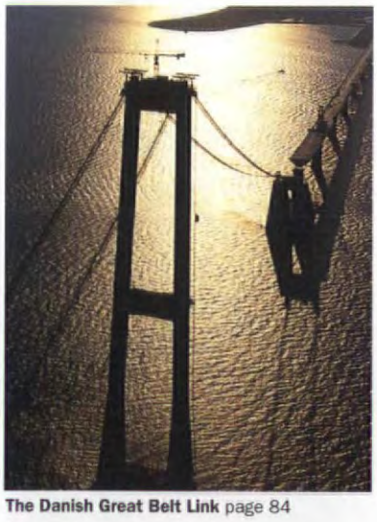

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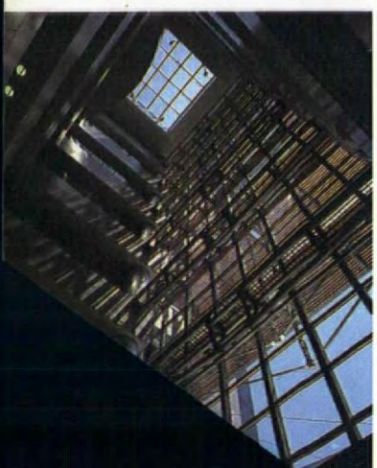

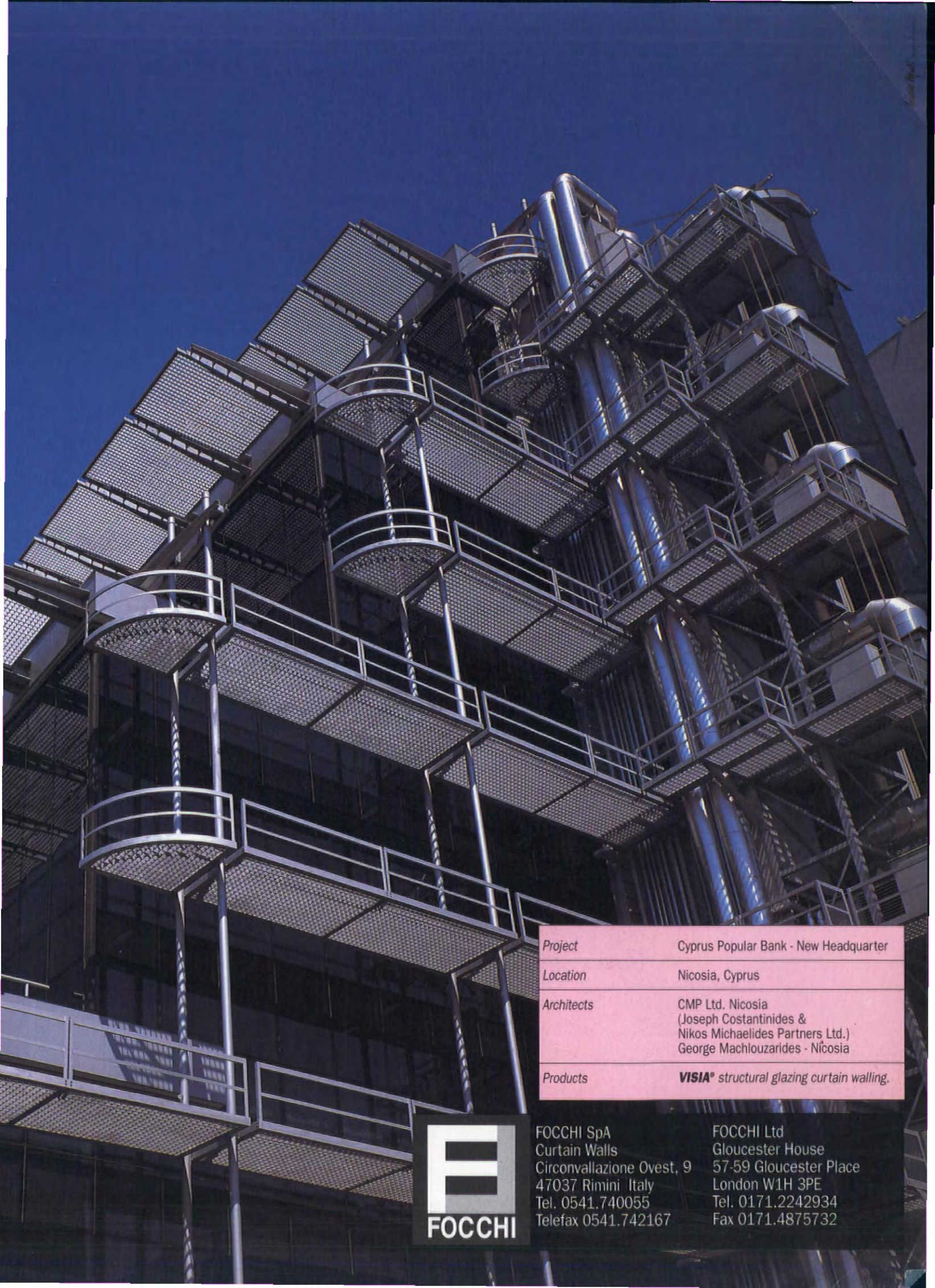

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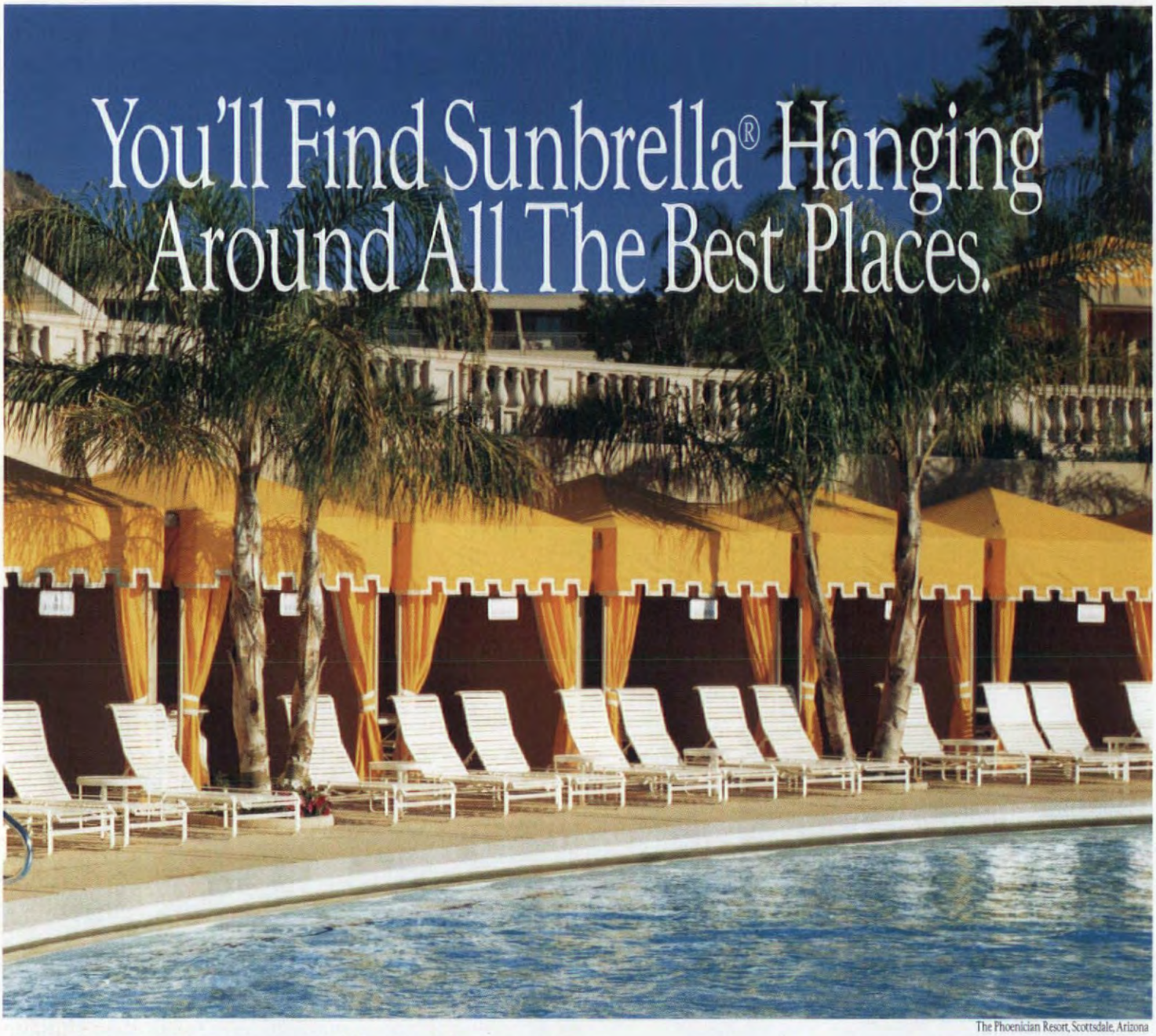

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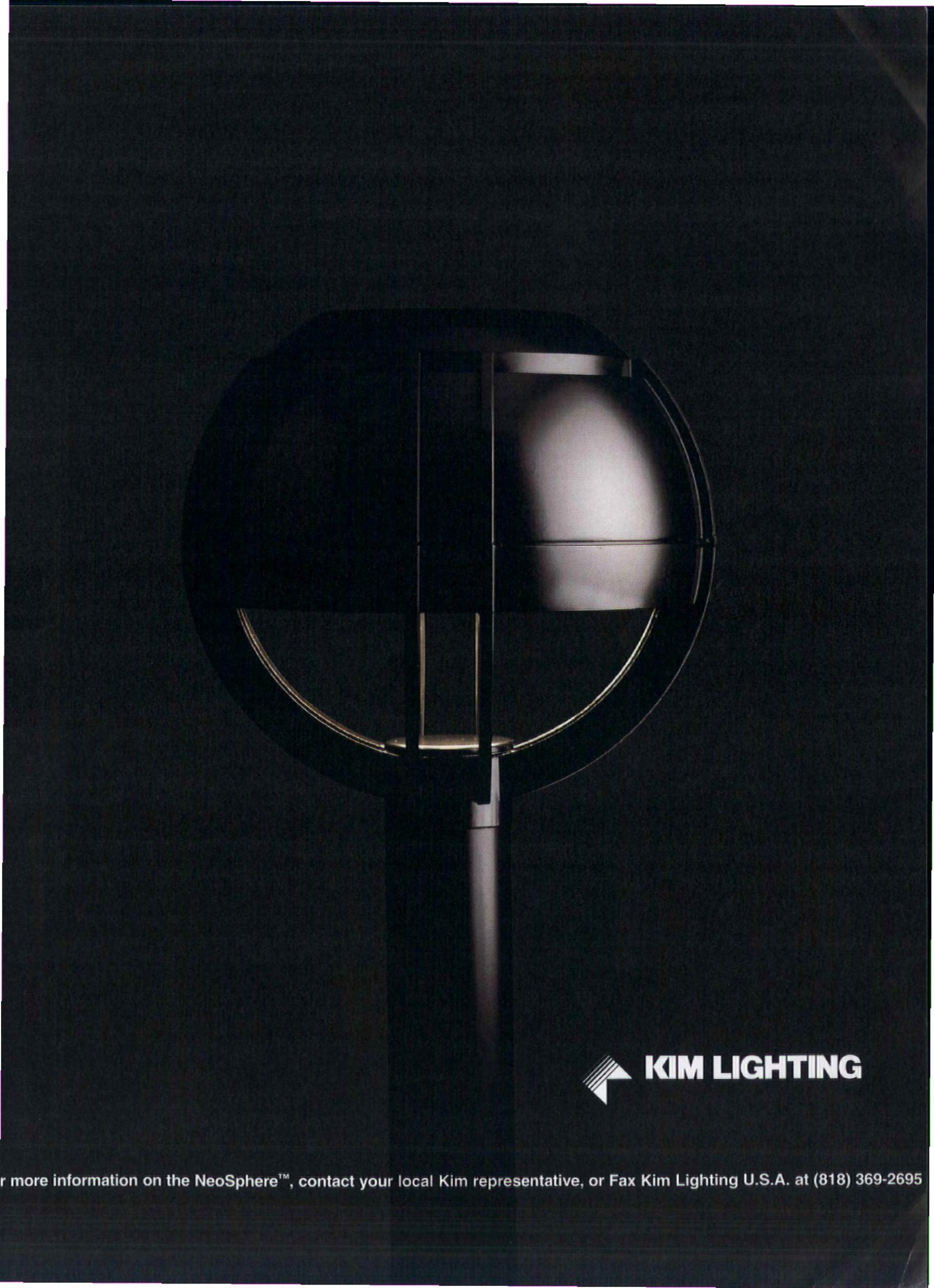

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Improved Indoor Air - Hand in Hand with Energy Efficiency

Indoor air quality is now well and truly under the spotlight and industry and governments alike have begun at last to react to the potential health problems posed by inadequate ventilation – in the UK for example, the extension of the Workplace (Health, Safety and Welfare) Regulations, 1992 to include existing commercial and industrial buildings now places the responsibility for maintaining the quality of indoor air firmly in the hands of the builder, owner, operator or his facilities manager. A great deal of behind the scenes work is also being carried out into the effects of poor ventilation, with no less a body than the World Health Organisation sponsoring research into the causes of "sick building syndrome" (SDS) and the broad spectrum of respiratory complaints that increasingly plague modern life.

The fact is, the air we breathe, already an unpleasant cocktail of organic and inorganic pollutants such as carbon monoxide and carbon dioxide, formaldehyde, nicotine, airborne dust and microbes, is deteriorating fast and if taken in combination with inefficient ventilation looks to be a likely cause of SBS - an ephemeral and difficult to locate complaint -yet one which in America is automatically investigated as a possible culprit whenever five percent or more of a workforce is sick at any one time.

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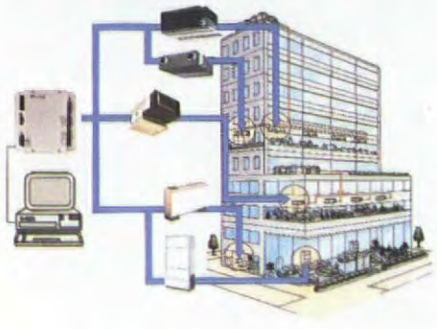

Fresh air of course is a key component of a balanced and equable indoor environment but its provision via often complex ventilation arrangements can have dramatically adverse effects on the efficiency levels of air conditioning systems which need to allocate cooling load to temper it. Leading air conditioning manufacturer, Daikin Europe however, has addressed this problem with the introduction of HI-VRV, a complete environmental system, combining VRV air conditioning, HRV heat reclaim ventilation and D-BACS dedicated control and monitoring, offering potential reductions in energy consumption of up to 23 percent.

The impact of Daikin VRV air conditioning on the European commercial building services market is already well documented and needs no amplification here: suffice to say that the 25,000 plus successful European installations stand as a testament to its technologically advanced concept and exceptional efficiency. Widely accepted by architects, consulting engineers, property developers and contractors alike, Daikin VRV air conditioning can now be found in a wide range of commercial and public buildings. Not surprisingly , the VRV has undergone considerable development and can now be had in cooling only, heat pump inverter, heat recovery and heat reclaim ventilation forms - all designed specifically to provide efficient and flexible comfort cooling and/or heating via up to 16 indoor fan coil units. The HI-VRV, however, takes VRV technology several stages further.

The heart of the VRV system is a high efficiency heat exchanger which continually modulates the humidity and temperature of incoming fresh air to match the prevailing indoor conditions. A balance is thus achieved between indoor and outdoor ambients, enabling the cooling load placed on the air conditioning system to be reduced. Some 17 percent of this reduction is the result of lower energy losses, the remaining six percent being recovered from operating air conditioning and ventilation in combination.

Time moves on however and advances in data processing have enabled Daikin engineers to improve the system's heat reclaim capabilities still further by the use of an upgraded heat exchanger. The utilisation of high volume data processing has improved the transmission speed of the combined control system to a level 40 times higher than conventional systems. Combining this new HRV with a Daikin VRV or Skyair split system employing the same transmission system, enables sophisticated control of both air conditioning and ventilation to be provided via the fan coil remote controller.

The third vital constituent of the HI-VRV is the D-BACS dedicated, computerised central control and monitoring system, produced by Daikin in answer to the need for improved air conditioning management and higher system efficiencies. The application of D-BACS to any Daikin VRV system will provide end users with vital air conditioning performance and comfort or efficiency. D-BACs in fact, can control up to 24 VRV outdoor condensing units and 48 indoor fan coils simultaneously and if connected up in parallel, can enable as many as 1,000 fan coils to be controlled from just one personal computer. Custom designed management facilities plus the indication and recording of malfunctions or installation faults can be highlighted - and software functions can be used to cover centralised management, timing, demand and service facilities, thereby providing the most comprehensive overview of the VRV operational pattern and status.

Like the VRV, D-BACS has been refined and updated to offer ultra precise control over running costs and energy usage to both building owners and tenants. The latest D-BACS system applied to the HI-VRV has many improvements which include a pug in board to provide the PC with direct access to pulses from a kWh metre, enabling energy consumption per unit, room, tenant, floor, zone or for the entire building to be measured and logged every five minutes. External signals indicating doors to be opened or closed, fresh air fans or lighting to be switched, gas detection, air conditioning emergency shut down etc., can also be handled from the same PC. Also, its new remote temperature sensing pack with calibration box indicating outdoor temperature on an LED can be located up to 1,200 metres away.

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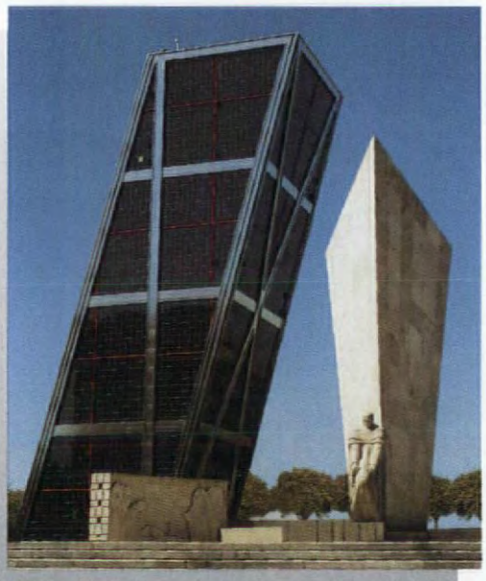

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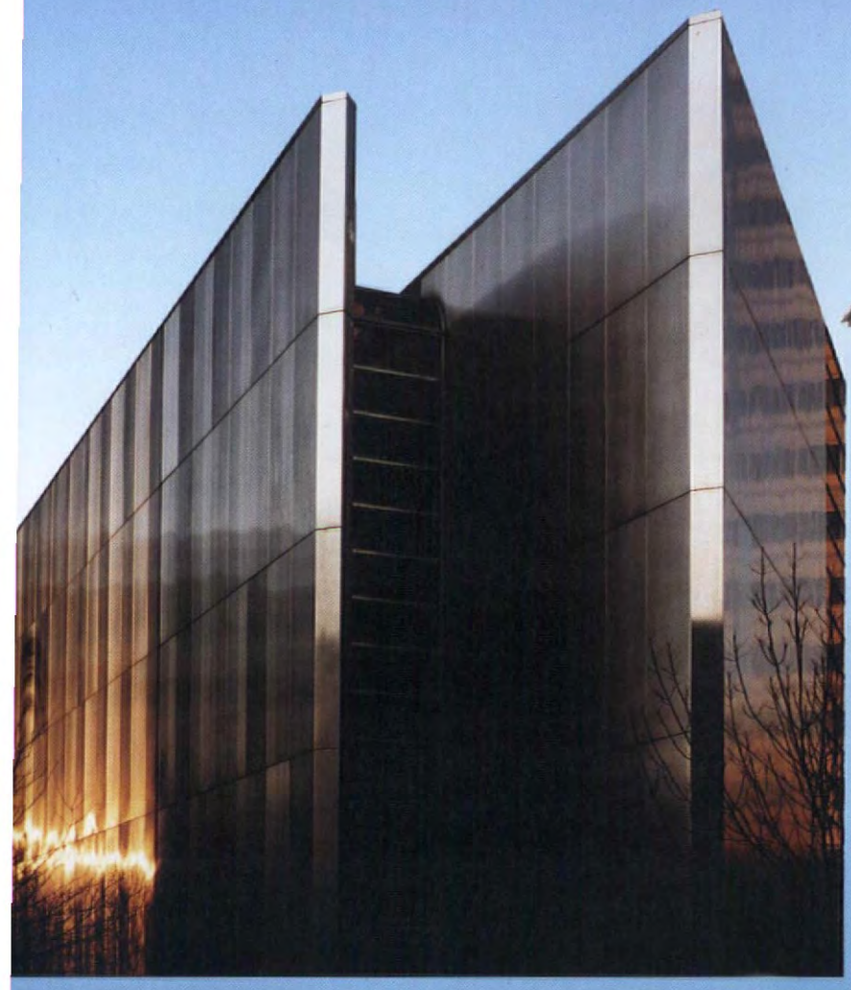

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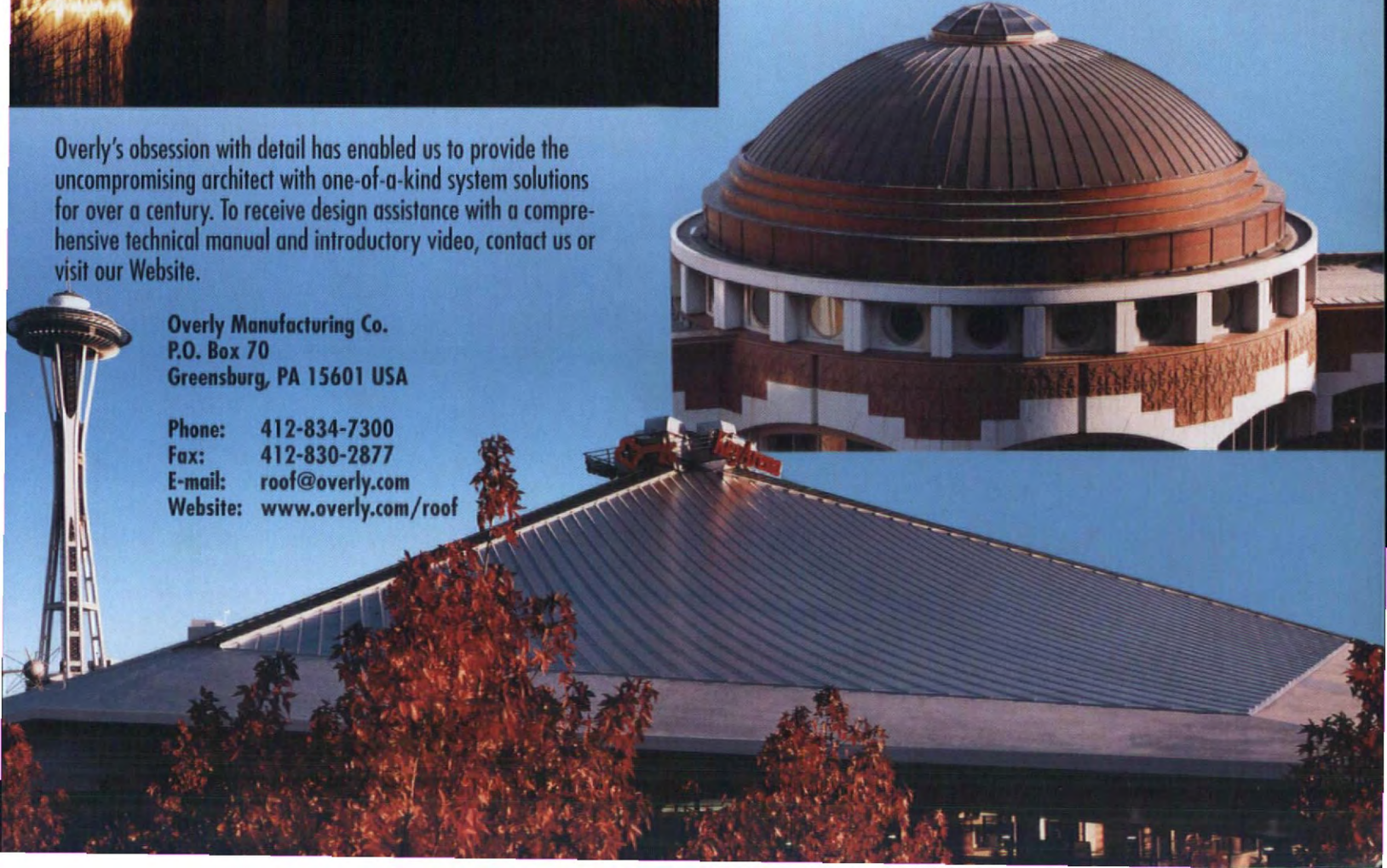
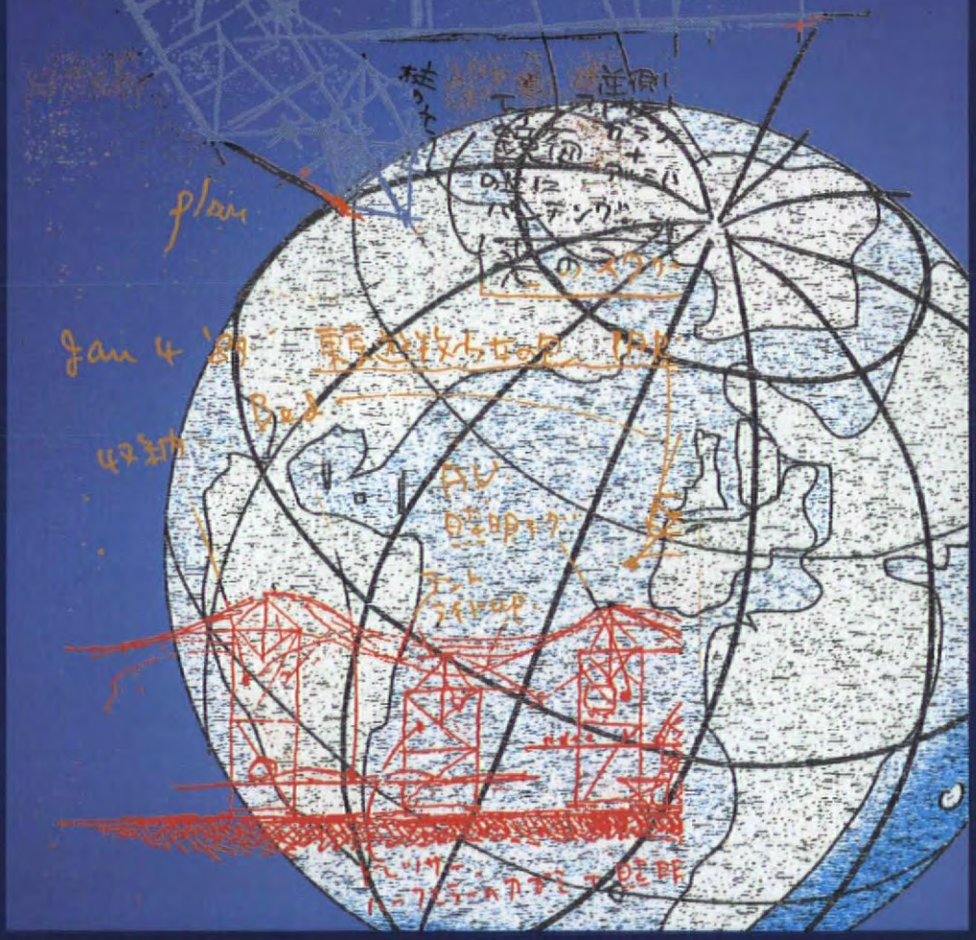


THE GIANTS OF WORLD ARCHITECTURE



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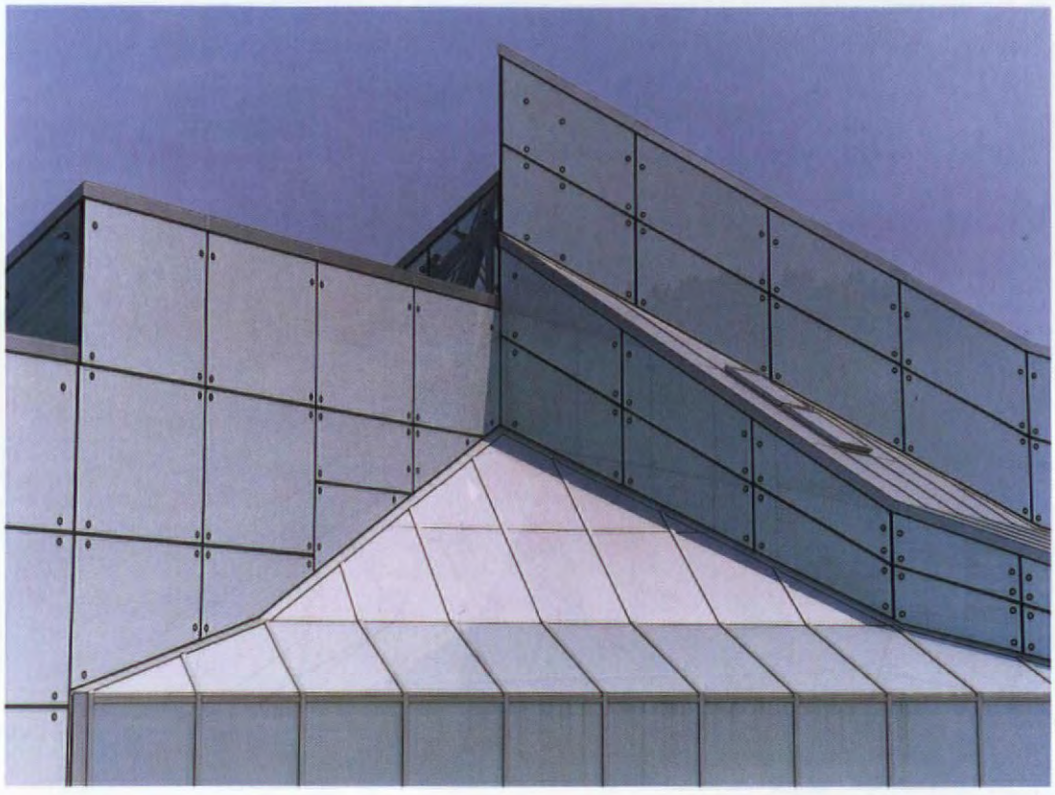

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In praise of the big and the beautiful

Since *World Architecture* began its series of profiles, in the first issue of the magazine, smaller "gems", for example the work of Berthold Lubetkin, Oscar Niemeyer and Thomas Herzog, have been contrasted with sprawling urban developments and glistening glass-clad skyscrapers by such North American corporate giants as Gensler, Kohn Pedersen Fox and NBBJ, the South American, Pedro Ramírez Vazquez, and German firms including Bremmer Lorenz Frielinghaus. This year promises more revelations into the history and running of global firms such as these, including that of the Japanese theorist and practitioner, Kisho Kurokawa, in next month's issue.

The profession is largely made up of architects working in huge corporate, but lesser-known firms, plus a prolifery of one- or two-man bands. There are fewer architects who find a drawing board or CAD station with one of the world's more celebrated *ateliers* whose work fills the majority of architectural and design magazines. This is why *World Architecture* continues to address the international business community of architects and to do this we dedicate the profiles to the work of those with a truly international portfolio; firms that circle the globe in pursuit of work in developing countries as well as at home. As one of the lead stories in this month's business round-up reveals, it is the larger construction firms, many of which incorporate their own architects, that often act as catalysts for overseas developments by way of making a financial commitment and encouraging other private investors; it is these firms that are increasingly driving the industry and playing a part in dictating the next region for economic and structural development.

This is not, of course, to the exclusion of more glamorous "signature" architecture. This issue with its rich images portraying the diversity of Mexican architecture, and the skilled design and engineering prowess of some of the world's most talented bridge-builders, is a case in point.

Finally, 1997 also brings with it the sad news of the untimely death of *World Architecture's* first editor, Peter Dormer, at the age of 47. Art Director Rob Norridge worked with Dormer from the launch of *World Architecture* and recalled Dormer's description of himself as "a mixture of academic and second-hand car salesman", contributing to the intellectual content of the magazine, whilst fully understanding the commercial aspect of publishing. "He was a wonderful writer with a marvellously ironic sense of humour, immensely liked by all who worked with him and knew him. He is, and will be, sadly missed."

Nicola Turner

What is criticism for?

"It's all too easy to put a stop to development and turn other continents, as well as Europe, into open air museums as a result."

Last November a spokesman for the American financial services conglomerate Merrill Lynch caused something of a stir. He told a group of financial journalists; "Don't worry about the European Community, in twenty years time it will be an open air museum."

At the time, EC politicians and businessmen were tempted to laugh at this prediction, but in the end they didn't.

The truth is that criticisms of this kind have an ominous ring to them. They awaken fears of a weakness that is overtaking Western development in general. A weakness whose effects can be seen in Eastern as well as Western Europe, and in the US as well as Asia. When the construction professionals of the West look to their governments and their big corporations for initiatives, they find grand infrastructure plans downsized, or replaced by computer systems and information technology projects that hardly involve building at all. How can it be that the engine of economic growth is failing? Surprisingly, architectural criticism is the answer.

A month or so ago a row blew up in the Czech Republic over comments made by president Vaclav Havel about a newly opened mixed use development jointly financed by the city of Prague and the French developer CDC. The Myslbek development in the centre of Prague, said the president, was a "construction without fantasy or ideas that is insensitive to the character of the street and fails to relate to nearby historic palaces".

Although the feathers ruffled by these presidential remarks have now been smoothed back into shape, the very fact that they were made at all is remarkable, for Myslbek is not only architecturally unexceptionable, but a tremendous commercial success. Nearly all its 17,000 square metres of modern office floorspace was let off the drawing board to such blue-chip financial services corporations as the Czech National Bank, Crédit Lyonnais and BZW. The retail take-up is equally impressive, headed by such category killers as Marks & Spencer, Kastner & Ohler, Next and Clinique. In short, Myslbek is precisely the kind of development that the "Eastern bloc" has been deadly serious about attracting ever since the overthrow of Comecon system. Myslbek is the kind of mainstream commercial architecture that would be welcome in London, Taipei or Singapore. Why then is it considered too crass for Eastern Europe?

The Myslbek episode is strangely reminiscent of another piece of unwise, but effective criticism. In 1994 there was a tremendous furore in architectural circles in China when it was discovered that Western developers and their architects were trying to unload ten-year old high rise and retail park designs on Chinese cities. Within weeks of the publication in the US of a number of 1980s projects alongside the very recognisably doctored versions being hawked around China – with their added pagoda roofs and pairs of dragons to mark entrances – there was a sudden shake-up in the cast of architectural firms considered *persona grata* in Chinese development circles. Some Western firms of architects were so badly hit that they have had to rely on arm's length representation ever since. Of course their projects had been discounted already, and of course everyone knew that "backlog projects" were being used. But such was the effect of the criticism that the problem was not Western architect versus Chinese developer – it was Western architect and Chinese developer versus state design office and powerful politician. China at the time was a whirlpool of investment, drawing in US$250 billion a year from all over the world. There was no commercial impediment to running up replicas of 1980s schemes – but there was a political and planning system accustomed to absolute power, and all the more sensitive to criticism because of the threatened loss of it.

Who then originated the criticism? In the Czech Republic the media asked why, if president Havel had brought down a 40-year Czech communist regime without so much as a fax machine, he could not stop a simple development project he disapproved of? Havel made no answer. In China the media reported American comments on its own architects' crass designs. The response of senior politicians was to torment the offenders. To tantalise them with the prospect of contractual agreement whilst all the time starving them out, delaying them until they returned whence they came, their ten-year old schemes still unbuilt.

In both these cases, the nature of the critique was architectural, but not ineffective. And it originated, not in the receiving nations in Eastern Europe or Asia, but in the donor nations of Western Europe and North America. To dismiss Myslbek as "insensitive" and "disrespectful", or the project for the Grand Gateway, Shanghai, as being "derivative" and "tokenist", is to be self-evidently Western. Time and again the passive Western champion of "human scale" and "heritage values" accuses the developer of "insensitivity", "vandalism", "philistinism" or just plain greed, begging instead for restraint, caution and a tentative, revivalist, regional, site-specific sort of architecture that will disturb the historic appearance of things as little as possible. Time and again the economic and political result is disproportionately destructive.

President Havel learned his architectural criticism in the same school of nostalgia as the critics who deplore the recycling of old American work in the Orient. The school is a bad school, for clearly neither was taught the needs of the development process. Everywhere in Western Europe there are relics of the old and fragments of the new – as well as plans for more relics of the old and plans for more fragments of the new. Everywhere in Eastern Europe and Asia there is a different, more receptive spirit. Notwithstanding the objections of the Czech president and the Chinese politician, it is all too easy to put a stop to development. All too easy too, to turn other continents, as well as Europe, into open air museums as a result.

Martin Pawley

News Review

WA's News and Business round-up

Las Vegas takes a bite of the Big Apple

A US$460 million development which has already been referred to as the "largest piece of Pop Art in the world" opened in Las Vegas, on 3 January this year. Developed by New York-New York Hotel & Casino – a joint venture between MGM Grand Inc, and Primadonna Resorts Inc – the project is located on a 20-acre site outside the city limits, leaving the development comparatively free of planning restrictions. The notion is that just as immigrants and prospectors rushed to New York at the end of the nineteenth century in search of their fortune, so businessmen and tourists are currently setting their sights on Las Vegas as the twentieth century draws to a close. The city accommodates 30 million visitors annually, added to the fact that the population has nearly doubled in the last ten years to 1.1 million.

The centre-piece of this predictably brash visual metaphor is the hotel and casino itself: made up of a series of 12 New York-style towers – totalling 47 storeys and reaching 529 feet at its highest point.– the towers all rise from a single base building. Approximately one-third the size of the original buildings the 12 towers are replicas of, amongst others, the Empire State Building, the Seagram Building, the Chrysler Building and Lever House Soap Company. The 84,000-square-foot casino has been themed with a variety of NYC's landmarks: Park Avenue, Central Park, Times Square, Little Italy, Penn and Grand Central Stations.

Other attractions to the resort include the "Manhattan Express" – a high speed roller coaster – based on the Coney Island original and a 300-foot-long replica of Brooklyn Bridge which forms the entrance walkway. But the developers have been restricted in their reproduction of architectural landmarks within the theme park. The Guggenheim Museum, for example, refused permission to replicate Frank Lloyd-Wright's masterpiece.

Even more recently opened on the opposite side of the street to New York-New York is the Coca-Cola Building, an eight storey, glass Coca-Cola bottle. The 100-foot structure contains two "scenic" elevators, and was part-finaced by André Agassi. The architects of the restaurant, the Domingo Cambeiro Corporation, have produced a piece of pure Americana, an international symbol of all that the US have held dear throughout the twentieth century. In doing so they have created a landmark for Las Vegas to call its own: in the same way that the Statue of Liberty – a gift from the French government based on the three principles of the French revolution – greeted visitors to New York a century ago, so an outsized corporate symbol stands guard over a mecca of twenty-first century indulgence.

Giant construction firms chase overseas work

As governments around the world face increased pressure to decrease their public deficit, investment in the construction industry is likely to take a tumble – many governments recognising the political advantage of retaining expenditure on public services directly effecting the electorate, such as health and education. As a result of the cutbacks the larger construction firms are under pressure to chase work overseas. According to predictions from EuroConstruct, a federation of industry and economic forecasting bodies from 15 western European countries, construction output in the region is likely to rise by a paltry 0.8 percent in the next year, less than half the predicted general economic growth rate for western Europe. Although public works, including infrastructure developments, are prolific in south east Asia, even there governments are increasingly aware of the need to find alternative means of funding construction.

In their report EuroConstruct confirm the worldwide trend for greater contributions from the private sector, and international contractors are increasingly expected to take equity stakes in schemes.

The International Finance Corporation (the private investment arm of the World Bank) estimates that the total financing of new private infrastructure projects in developing countries has doubled from US$17 billion to more than US$35 billion between 1993 and 1995. The IFC also report that a further US$10.1 billion of infrastructure assets were sold in 1994 as a result of the privatisation of 75 companies in 30 countries.

Smaller firms have little place in this market. The larger and richer the firm the greater the confidence of the private sector investors. The well respected firms such as the French Saint-Gobain, Japan's Kajima Corporation and Corning of the US, are likely to act as catalysts for schemes once they show financial commitment. Statistics indicate that the larger the firm, the higher the proportion of overseas work.

In brief

ALBANIA

New hotel in Tirana

TBV Inston, the specialist hotel design consultancy arm of British firm Tarmac Professional Services, has been appointed by Mohammed Abdulmohsin Al-Kharafi and Sons, as interior designer for a £12 million (US$19.2 million) fit-out of the new Hotel Inter-Continental Tirana, Albania. The 279-room hotel is due to open early in 1998.

CHINA

SOM make financial sense

Skidmore Owings & Merrill have won a competition for the master-planning of Beijing's International Financial Centre, a 1.7 million-square- metre development in the centre of the city. The brief included a financial/business district, a residential area, housing for relocated residences and support facilities.

CUBA

Banana competition

The winners of the design competition, Banana, have been chosen by a jury of eight architects – including Arthur Erickson and Derek Walker. The highly unusual competition brief required a banana museum and an opera house for Havana, Cuba. The development is part of the wider scheme to rebuild Havana after decades of decay under Fidel Castro's ideologically driven regime. A representative of the city's urban design team, Maria Elena Martin, was present as the jury announced their decisions late last year in Los Angeles. First prize was awarded to the Montreal, Canada-based team of Jean Beaudoin, Anik La Brie and Martin Leblanc. The second phase of Banana is due to commence in March, with input from a Cuban juror.

NORWAY

Kværner's international expansion

Kværner ASA, the Norwegian engineering company that bought Trafalgar House Property Ltd, London last year is looking to expand its international construction work while it is in the process of reshaping Trafalgar. Kværner's chief executive, Erik Tonseth also stated that he expects the company to concentrate on a smaller number of large-scale projects in the UK. Tonseth is aware that while there are many opportunities abroad – principally in bridge construction and tunnelling – it is essential to have a stable home market to sustain international expansion. In the five months to September last year the UK construction division made a pre-tax loss of £2.4 million (US$3.84 million), this accounted for profits made by Kværner in India and Hong Kong.

THE NETHERLANDS

KPF finish the job

Kohn Pedersen Fox Associates (KPF) have designed the last tower in a high-rise zone on the Coolsingel in Rotterdam, the Netherlands. The building's clear glass 29 storey atrium will be the principal feature of the structure. The space is to be filled with glass lifts and bridges. The use of natural ventilation will be incorporated into the design, using the atrium as a "thermal buffer", thereby eliminating the need for cooling and reducing mechanical costs. Completion is anticipated in 1998.

POLAND

Koreans develop an American design in Poland

RTKL Associates have completed design work on the Warsaw Business Centre, Poland. The US$50 million, 40-storey office tower will be developed by the Seoul, Korea-based Daewoo Corporation. The 50,000-square-metre development will be located on the northern edge of Warsaw's central business district west of the Wisla River, and will house Daewoo's Polish headquarters. The design combines cubic and semi-spherical forms in an attempt to create a landmark project worthy of the investment undertaken by Daewoo in a still growing eastern European economy.

SINGAPORE

Cheap intelligence

Singapore Network Services (SNS) have commissioned Oscar Faber Information and Communications (OFICE) to produce a low-cost "intelligent building" for its new Singapore premises. The 11,000-square-metre building, primarily office space, will use advanced communications technology, providing a net saving in capital cost of £250,000 (US$400,000).

UK

Chapman Taylor move into Europe

British firm, Chapman Taylor Partners are focusing on eastern Europe. The company have bought Düsseldorf-based Brune Architektur with a view to developing operations in central Europe, notably Poland, the Czech Republic and Hungary.

... and so do Bovis

Bovis Europe have won contracts in Hungary and Slovakia. In the Slovakian capital of Bratislava the company is project manager for two schemes. The larger involves the conversion of a former Communist Party hall into an exhibition centre. Further down the Danube in Budapest, Hungary, Bovis are working on a £5 million (US$7.5 million) construction management contract, building a transit warehouse for P & O Trans European.

Cardiff plays it safe

Although Zaha Hadid's ill-fated plans for the Cardiff Opera house have been replaced by Percy Thomas Partnership's Wales Millennium Centre Cardiff County Council have declined to support the venture – the threat of having to bail out the £86 million (US$137.6 million) development, if it were to run at a loss, was given as the reason. The Council have instead focussed their efforts on securing planning consent and Millennium Commision funding for the Taff Waterway Initiative, a more far-reaching project aimed at upgrading the Welsh capital's riverside and public areas.

Oscar Faber ring the changes at Somerset House

Oscar Faber have won a second art gallery contract within London's Somerset House. The company will be responsible for the structural and building services work of a £10.5 million (US$16.8 million) gallery being constructed in the south wing and River Terrace to house a the £100 million (US$160 million) Gilbert Collection. This contract follows Oscar Faber's recent commission to design close control air conditioning for the Courtauld Gallery in Somerset house's north block. The south wing is due to open in Spring 1999.

Rogers in Soho development

Richard Rogers Partnership have been commissioned to design a new office building, by Derwent Valley Holdings PLC, in Soho, London. The £18 million (US$28.8 million), 2,865-square-metre development will be located at 15/17 Broadwick Street at the junction with Berwick Street. The new building will feature a curved screen from the first floor to the roof level. Construction is due to start in early 1998, with completion a year later.

USA

On the Waterfront

The top awards at the 14th international conference on the urban waterfront planning and development, held at the Waterfront Center, Washington DC went to two significantly different projects, halfway round the world from each other. The town of Bergen, Norway was honoured for a development that incorporates new construction with reconstructed medieval wharf buildings on the harbour. In the US the Spokane River Centennial Trail – a project which protects the river corridor while offering recreation and economic development opportunities along a 40-mile trail. Thirteen other Honor Awards were also presented to projects from Europe, Canada, the US and Australia.

Erratum

In *Trans-formal architecture* (*WA*50) we omitted to credit the other designers working in collaboration with Winka Dubbeldam. They are: BIO-LAB. MO.IAVE DESERT – co-designed with Douglas Gauthier; 2D-4BX, BEIRUT – with Jeremy Edmiston; DIS-A-PIER, YOKOHOMA with Maggie Mahboubian. We apologise for this error.

Manchester rises from the ashes

EDAW have won the international urban design competition to rebuild Manchester's city centre, devastated by an IRA bomb on 15 June last year during the European football championships (Euro 96). The competition was initiated by the UK's Deputy Prime Minister Michael Hesletine, and organised by Manchester Millennium Ltd (MM). EDAW worked together with six collaborating partners – including architects Simpson Associates, developers Benoy, and consultants Hillier Parker.

After the announcement Richard Leese, Deputy chairman of MM said: "Just days after the IRA bomb we promised to rebuild the city centre in a way that befits the twenty-first century. We wanted a centre with more shops, more leisure activity, more housing and more jobs... but with first class transport access. EDAW's winning submission gives us a superb basis for doing just that". The focal point of the proposal involves the transformation of Cannon Street into a "Winter Garden"; it will be covered to establish an east-west axis route from Church Street to the Victoria Street Bridge. Added to this, the Arndale Centre – a building that never achieved the level of public popularity that Manchester City Council had hoped for – will be re-clad and given an entirely new identity.

The services of the Building Design Partnership (BDP), designers of another of the five short listed schemes, were also retained. The jury – which included Sir Alan Cockshaw, Chairman of MM, Owen Luder, President of the RIBA and Richard Leese – were impressed with the firm's proposals for the pedestrianisation of the area around Manchester Cathedral, Chethams School of Music and the integration of the River Irwell into the city's urban fabric. BDP propose to close Victoria Street and Fennel Street in order to establish a new Cathedral Green which will run down to the river bank, creating a new public space.

MM hope that construction of the £500 million (US$800 million) rebuilding programme will begin this year, with completion expected in 2002.

***Above** BDP's proposal for the new Manchester Cathedral Green. **Left** EDAW's winning proposal. The Arndale Centre is on the right of the picture and the covered "Winter Garden" is directly behind it*

Growing confidence in Hong Kong market

1996-end-of-year reports from top US investment banks including Goldman Sachs and Merrill Lynch, and real estate agents Jones Lang Wootton, indicate that the prospect of the handover of Hong Kong to the Chinese mainland in 1997 is having fewer detrimental effects on the property sector for the territory than previously predicted.

Foundations are being laid for a HK$40 billion (US$4.5 billion) scheme on reclaimed land in Hong Kong's harbour including hotel, offices and an 85-storey tower, which on completion will be the city's tallest building. This is just one of the major schemes indicating the property market's bounce back after the downturn of 1994-1995. Developers including Great Eagle, Henderson Land and Cheung Kong all plan massive investments in the next year, with one prediction for the total investment of the top dozen or so developers estimated at HK$630 billion by 2000.

But as one US bank commented "there is still a question mark over whether the upturn can be sustained".

Dream on power developers

The Battersea Power Station is a very British icon from the latter stages of the industrial revolution. Although there are parts of that revolution that the British would prefer to forget, it is a fundamental part of the country's heritage. So Londoners are puzzled at the developers proposal for a Las Vegas-type transformation of this central 12.2 hectare London site, which makes no reference to the building's original function. It may be something to do with the fact that the entire scheme has been dreamt up by the Taiwanese-based Parkview Group Holdings and the Western US-based Gordon Group Holdings. Fortunately UK-based Arups have been involved on the engineering aspect of the project since May, since when the overwhelming Canary Wharf-height city scape that was proposed for the site has been moderated so that none of the surrounding buildings exceed the height of the power station chimneys. An elegant glass covered access line between the rail link with Victoria and the river has been introduced and things are looking up. However, inside the enormous Art Deco atrium, the Singapore/US designers have had a field day with a giant coloured fountain set to music and a Disneyworld set up of rides and shops. Above the fake sky projected onto the ceiling, they are planning a huge multi-screen cinema for which the Warner brothers appear to be making a serious bid. The development is a flight of fantasy for which English Heritage and the Department of the Environment have given their provisional support, presumably due to the desperate need to halt the decline of the fabric of the disused power station, and the lack of other funders. But who are the developers hoping to attract? Tourists inevitably visit London to see the wealth of historic landmarks, and all that a great capital city has to offer; they are less likely to be attracted to another Las Vegas. The concern of Londoners is the application of international ideas applied insensitively to the capital's centre – as at the Trocadero development in Piccadilly.

People and Practice

Institute News/Awards

AUSTRALIA

DCM make an exhibition of themselves

Denton Corker Marshall (featured in WA*49*,) have been awarded the Royal Australian Architects' 1996 Building of the Year Award for their Melbourne Exhibition Centre. The £56 million (US$89.6 million) column-free structure is located next to Melbourne's Yarra River. The flexible internal walling system, within the 360- metre by 84-metre interior, allows the building to be used for a wide variety of community and conferencing events.

UK

Hodder Associates win Stirling Prize

The young Manchester-based firm of Hodder Associates won the first ever Stirling Prize, awarded in late November 1996, for their University of Salford Centenary Building, Manchester. The £20,000 (US$32,000) prize is awarded to the building which has made the greatest contribution to British architecture in the past year. The jury , which included RIBA President Owen Luder and sculptor Sir Anthony Caro, were unanimous in their decision despite the presence of some well-established figures on the short-list – Michael Hopkins & Partners' Queen's Building for Emmanuel College, Cambridge was widely expected to win. On accepting the award Stephen Hodder said: "I don't like to think of it as beating established names, maybe joining them".

Solid as a Rock at the RIBA

In December last year David Rock, founder in 1971 of Rock Townsend, defeated Clare Frankl, in the hotly-contested race for the Presidency of the Royal Institute of British Architects. He won 57.8 percent of the votes, and will take over from the current President, Owen Luder, in July 1997. He said: "My vision for the Presidency is a better deal for architecture and architects... I want the RIBA to be a place with which the heroes of the profession can publicly indentify..."

Excellence in Design Awards Gala, AIA UK

The winners at the third annual American Institute of Architects' London gala were announced in December last year. The awards programme recognises excellence in architectural projects anywhere in the world designed by European based architects, and projects by architects throughout the world designed for Europe. The winners were Sauerbruch Hutton Architekten's Centre for Innovation in Photonics, Berlin, Germany ; Robert Albanes's Planetarium & Research Centre for future Studies, Greenwich, UK; David Morley Architect's Indoor Cricket School at Lord's Cricket Ground, London, UK, and Reichen + Robert's Nestlé France Headquarters, Noisiel-Sur-Marne, France (featured in *WA*52).

USA

Once in a Lifetime

Michael Harris Spector FAIA has been selected to receive the Lifetime Achievement Award as presented by the Long Island Chapter of the American Institute of Architects, constituting a significant architectural contribution to the region. As well as founding the Spector Group (1965) and leading the firm to international prominence, Spector has also won one of the largest architectural commissions in the world: to master plan what will be the third largest city in China.

AIA honour Richard Meier

Richard Meier, FAIA has been selected to received the American Institute of Architects' (AIA) 1997 Gold Medal. The AIA's highest accolade will be awarded to the architect on 7 February in Washington DC. The gold medal recognises a lifetime's achievements in architecture and the human environment. Meier will be the fifty-fourth recipient of the Gold Medal.

Currie flavour of the day in Florida

The Robert G Currie Partnership, architects and planners based in Delray Beach, Florida were honoured for their design of the South County Civic Center by the Palm Beach Chapter of the AIA, at their forty-ninth annual awards ceremony.

Company News

GERMANY

What's in a name?

Real estate developer Horsham Properties GmbH have changed their name to Trizec Hahn Europe (THE), following the approval of a merger between the Horsham Corporation and Trizec. The new company will combine the expertise of Horsham Properties, a successful central European land developer with the North American track record of Trizec, a leading developer, owner and manager of office buildings and retail centres, operated by Trizec's retail unit, The Hahn Company. Speaking after the announcement, THE's managing director, Philip Jones said that "the merger combines the liquidity of the holding company with the assets and resources of the operating company".

SOUTH KOREA

Strategic alliance

US firm HLW International and Korea's Joong-Ang Design Company have announced an alliance which will create a co-operative business partnership allowing joint project development in Korea, the US, Europe and the Middle East. Commenting on the move, Leevi Kiil, Chief Executive Officer of HLW said that "Korea is becoming an important area of new development for many of our business clients. At the same time Korean firms are looking for a presence in the US"

SWITZERLAND

Herzog & de Meuron move to London

Herzog & de Meuron, architects of the new Tate Gallery of Modern Art at Bankside, London have opened a new office at Bankside Power Station. The Basel-based practice will have a permanent team of 12 architects based in London. Harry Gugger, Design Manager will head the operation. The team will be overseen by Jacques Herzog.

UK

New chairman at RMJM

Mark Way has succeeded Colin Beck as Chairman of British firm RMJM. In common with many RMJM directors, Way's experience has come through serving time in the company's overseas offices – Way founded and then ran the now well established Hong Kong office. Way's professional career, most of which has been spent with RMJM, reflects the evolution of the company from predominantly serving the public sector to encompassing a far wider range of private and corporate clients.

RTKL expand in London

In recognition of the growing importance of the firm's London office, RTKL have announced a series of promotions: Gary Mardon and Glyn Rees have been made Associate Vice Presidents, and Tim Baker, Eilish Jeffreys, Chris Jones, Travis Leissner and Mariana Tweedie have been promoted to Associate status.

Anglo-Irish Association

Davis Langdon & Seah International, the world-wide partnership comprising leading UK quantity surveyors Davis Langdon & Everest (DLE), have formed an association with Republic of Ireland quantity surveyors Patterson Kempster & Shortall (PKS). Although not a formal merger it is hoped that the association will benefit both parties, it will offer DLE access to the ever-growing Irish market whilst bringing PKS many of the assets of partnership without diluting the company's identity or management.

DEGW go Dutch

The internationally-known architects and space planners DEGW (headed by former RIBA president, Frank Duffy) announced their alliance with Dutch management consultant Twijnstra Gudde, at the end of last year. Although TG is little known outside the Netherlands it has been involved in major work, including replanning Schiphol Airport and the Rotterdam docks. TG's 1995 profits of US$3.75million enabled it to buy DEGW for US$6 million – a sound investment since DEGW are already well recognised on the international scene. Duffy is confident that DEGW won't be pushed around by its new boss. "There will be change, but it will happen through projects. It won't happen through someone on the outside coming in and telling us to do this and that."

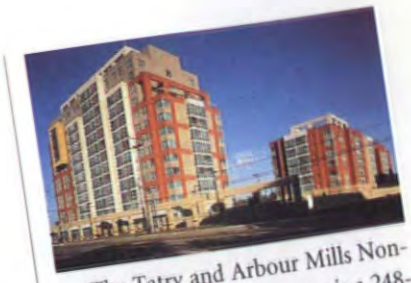
US firm plan a Chinese city for the next century

A New York architectural firm, John M Y Lee/Michael Timchula Architects are celebrating being selected over six finalists for the "modernising" of an existing town – Shenzhen, in the Peoples Republic of China – into a "world-class city". The town, a provider of fresh produce to neighbouring Hong Kong, has been designated a Special Economic Zone, and will serve as a laboratory in which industrial and economic growth can be controlled and monitored. As a result it has been given unique rules of taxation and ownership.

The scheme, which has a land area of around 100 city blocks of New York, will include 40 million square feet of floor space. "This is both the biggest project we've ever undertaken and as large as any we've seen. The scale and magnitude of this urban development is overwhelming" said Lee. Among the various mixed-use building categories to be included, the brief required the integration of two subway lines, six major highways, and public parks for 20 percent of the land area.

Quadrangle in natural habitat

Quadrangle Architects Limited, a Toronto, Canada-based practice have won an international World Habitat Awards for their design of the Tatry and Arbour Mills Non-Profit Housing project in Mississauga, Ontario. Sheldon Levitt, associate and project architect, accepted the award at the Duna Palace in Budapest, Hungary late last year. The World Habitat Awards, which are sponsored by the Building and Social Housing Foundation, UK, and recognise projects which "offer sustainable futures to residents and which provide practical and imaginative solutions to current housing problems in developed and developing countries". Two awards are presented annually, one to a project in a developing country, the other to a project in a developed nation.



The Tatry and Arbour Mills Non-Profit Housing development is a 248-unit apartment complex, consisting of a 13 storey and a seven storey building. Tatry was sponsored by a Polish community-based organisation; Arbour Mills combined the resources of three church and synagogue groups in Mississauga, Ontario. The project was conceived by Windleigh Development Inc, under a non-profit housing programme funded by the Province of Ontario's Ministry of Housing. The Green Catalyst Group consulted on energy strategy: through use of advanced construction systems for exterior walls and windows, and an innovative trigeneration system that generates electricity using natural gas and converts the waste heat from the process to heat and cool the building.

Calatrava offers inspiration for London's skyline

Santiago Calatrava's dramatic plans for the redevelopment of City Point, Moorgate follows Sir Norman Foster's Millennium Tower as the latest proposal for a tall building in the City of London. Should the proposal receive planning consent (and should the Millennium Tower remain on the drawing board), the 1960s office building – vacated by British Petroleum (BP) in December last year and now owned by developer Wates – would be the highest building in the City, at 204 metres. Calatrava's plans centre around the addition of four storeys (to the existing 33) and the creation of a distinctive identity for the building through the addition of a glass spire and cantilevered restaurant – also the highest in London. In total the tower comprises 63,000 square metres.

Whether the combination of dramatic proposals such as Foster's Millennium Tower and Calatrava's City Point signals the start of a wholesale realignment of London's skyline remains to be seen, but Peter Rees, chief planning officer of the City of London is keen to play down such suggestions. "I don't think anyone need worry that there will be a forest of towers [in the City] – they're just not funded." Rees also believes that lessons have been learned, "as a speculative building form it has been proved that towers are disastrous".

Birkerts on the market in Riga

Gunnar Birkerts and Associates are currently designing a new masterplan for Riga's Central Market, Latvia. The 15 hectare, river-side site has two major axes: east-west, along the right bank of the Daugava river, and north-south, perpendicular to the river. Storage buildings located on these axes will be redeveloped as both public areas and as sites for commercial use.

The proposed 28,000-square- metre expansion to the International Trade Centre focuses on a linear, glass, ribbon-like structure that will link the historic buildings at ground level and create new public spaces on the upper floors, including: conference and exhibition areas, and office and display spaces. The structure's glass walls will also afford new views over the historic market area and the city's central district.

The redeveloped central market area is due to open in 2001, to coincide with the eight-hundredth anniversary of the founding of Riga .

Birkerts is top dog in Michigan

Gunnar Birkerts and Associates Inc Architects have been awarded the title of 1996 AIA Michigan Architectural Firm of the Year, for the consistent production of "distinguished architecture".

Politics plays a part in resurrected plans for New York's Coliseum

Proposal by Tishman-Speyer Properties/Mirage/Morgan Stanley Partners

Proposal by Millennium Partners

by Peter Slatin in New York

A billion-dollar game of "mine-is-bigger-than-yours" is underway at the six-acre site of the New York Coliseum, an urban black hole and prime development site at the strategic south-west corner of Central Park in Manhattan.

The Metropolitan Transportation Authority – the huge public agency that owns the property, including a 600,000-square-foot office building, subway entrance and 550,000-square-foot convention centre – has been on the brink of selling it for the past 12 years. A ten year old deal to pawn it off to Mort Zuckerman, the developer who also owns the *Daily News* and *US News* and *World Report*, fell through in 1994. Zuckerman forfeited his US$34 million deposit which would have gone towards the US$335 million purchase price.

Now, in response to an official solicitation, nine developers have put forward their plans for the site in the hopes that the MTA and another public agency will deem their vision, and their bid, the most desirable "must have" for the city. The site's buildable area of 2.1 million square feet has led the developers to imagine everything from hotels to museums, although virtually every project calls for some residential and retail use as well.

Despite a variety of resolutions in terms of tower height and bulk (the maximum allowable height is 750 feet) the projects are uniformly sleek, with only a couple of real howlers, such as Roche Dinkeloo's blocky skyscraper with an outsize glass mansard roof. More elegant, but more predictable, is Cesar Pelli's promenade and towers, which could easily be called Battery Park City North or Canary Wharf West.

The only throwback to Zuckerman's lost proposal is that devised by his architects, Skidmore Owings & Merrill in collaboration with the firm Elkus/Manfredi (Disney's favourite retail design firm) for the Related Co development firm. This scheme calls for television studios to be situated in midtown. Another scheme that veers a bit far from the beaten track is that put forward by a development team of mall king Mel Simon and office expert Gerald Hines, who propose a vast, 600,000-square-foot entertainment centre. The plan was designed by Gensler.

Meanwhile, schlockmeister Donald Trump has co-opted Robert A M Stern for a glitzy hotel and residential tower, while corporate heavyweight Jerry Speyer has teamed up with casino mogul Steve Wynn of Las Vegas with architect Helmut Jahn on a proposed home for Sotheby's auction house. But Sotheby's is also listed on a proposal designed by Kohn Pedersen Fox for the developers Edward Minskoff and Richard LeFrak. "Our letter [from Sotheby's] is better," Minskoff boasted to a New York paper.

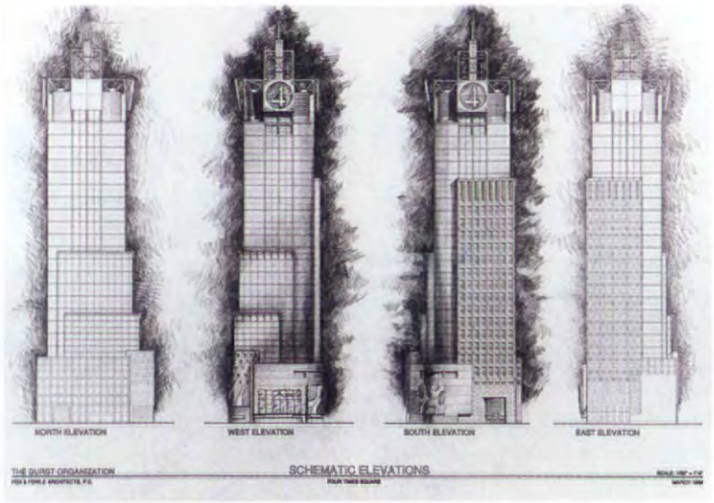
One plan, designed by James Stewart Polshek and Gary Handel for the Millennium Partners' development team, did hint at a bit of class in its slender tower profile. But Millennium has already built several large and successful projects just up the street from the Coliseum. Local politics, already a huge problem in determining the site's fate, could make it tough to award the site to a known quantity that could then dominate the area's retail trade.

Strange bedfellows in Times Square

by Judith Davidsen, East Coast US correspondent

No surprise: the first new skyscraper in New York in almost a decade will be shared by Condé Nast's chic magazines and one of the world's largest law firms, Skadden Arps Slate Meagher & Flom. Big surprise: the 48-storey environmentally responsible design by Fox & Fowle is rising smack on the corner of Times Square and 42nd Street, two arteries making a swift transition from X-rated to family entertainment.

Up to the early 1990s, four monumental towers designed by Philip Johnson and John Burgee for this famous intersection were expected to drive out "adult" businesses, but a shrinking market, abetted by 46 lawsuits thought to have been instigated by the Durst real estate empire whose adjacent properties had been left out of the heavily tax-supported deal, confined the project to the drawing boards. An interim plan condemned the low-rise X-rated 42nd Street properties between Times Square and 8th Avenue – including the tower sites – to facilitate their rehabilitation as state-of-the-art family amusement with bold, brassy roof and facade signage. Disney, Madame Tussaud, Sony and Warners jumped on board.



Left to right *The north, west, south and east elevations of the Fox & Fowle scheme. The south elevation faces the "flashy" end of 42nd Street, the east faces the "sober" end*

The interim plan was barely underway when Durst purchased one of the tower sites from partners of the much-sued developer George Klein, and began developing a skyscraper that would float in the sea of razzle-dazzle – 200,000-square-feet with a retail arcade at its base. Fox & Fowle designed two of the facades to reflect the commercialism of Times Square, and two other facades to reflect the more sober aspect of neighbouring Bryant Park and the midtown business district; the crown carries 60-square-foot signage and a communications tower. The designers consider the building, with its energy savings, air-quality protections, durable, recyclable materials, and (possibly) solar panels, "a laboratory for applied research". Interior designers are Mancini Duffy for Condé Nast and Gensler for Skadden Arps. Observers speculate that a Durst/Klein *détente* could lead quickly to towers on the other three sites, now filling up with tourist-oriented retail and theme restaurants.

The next frontier is 8th Avenue north of 42nd Street, where new pornography regulations are expected to make way for another stretch of towers on retail bases, and leave the Broadway theatre district surrounded on three sides by the sanitised corporate and domestic standards that, for a century, people came to the area to escape.

After season upon season of family oriented block-busters, however, Broadway struck back this year with "Rent", "Bring in da Noise, Bring in da Funk" and "Chicago", three of the grittiest and rauchiest offerings seen in the legitimate theatre in quite a while.

Hamburg's buildings measure up to a thriving economy

by Layla Dawson, Germany correspondent

In the competition to attract investment cities are having to recognise globalisation while acting regionally to make their own turf "fit" to meet the requirements of international capital. Hamburg has greatly benefited from the impulse German reunification gave for new investment. Since October 1990 the country's second largest city, located close to Berlin, with port facilities and traditional trade links beyond national borders, both east and west, has been seen as a safe profit centre and however invisible new information technology is, buildings are still the measure of a thriving economy.

Office building in City-Süd, Hamburg's commercial /office suburb by Jürgen Böge and Ingeborg Lindner-Böge

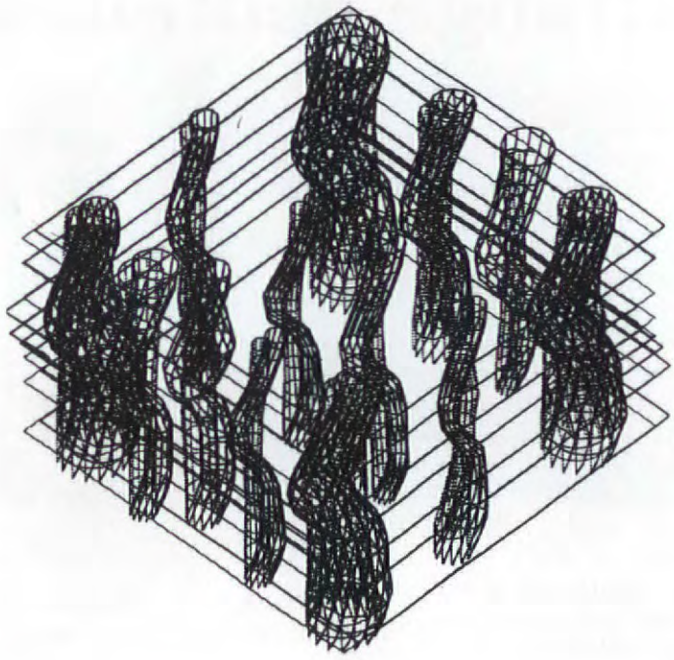
At the end of 1996 Hamburg's branch of the Bund Deutscher Architekten (BDA) invited submissions for a new architecture prize, in the future to be awarded every three years. Up to three projects from any one architectural firm, completed between 1991 and 1996, were eligible. Eighty-eight submissions were received, ranging from transport buildings, car showrooms and housing to historical renovations, sports pavilions, banks and offices. To avoid accusations of provincialism or self congratulatory backslapping the five-strong jury included four architects from Austria, Berlin and Denmark – two of whom were women – and nationally respected architectural critic Dr Manfred Sack.

The resulting exhibition of prize winners proved to be larger than expected. The jury insisted on all five first prize, 13 second prize and 67 third prize winners being shown. As a vehicle for open discussion on standards and the nature of development, the exhibition will appear twice in Hamburg and also travel – the next stop is Kiel. An accompanying book catalogue, published by Dollig and Galitz Verlag, serves both as publicity for the city's economic strength and the ability of its building professionals.

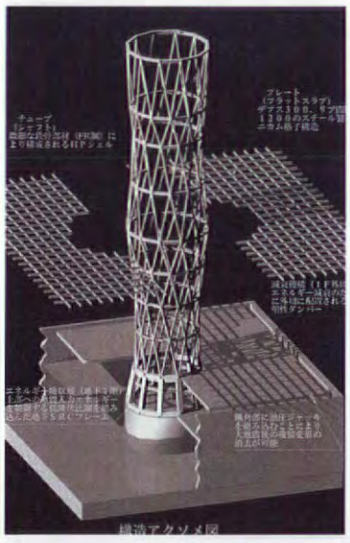
Jumbo Hall hangar for Lufthansa at Hamburg Airport by von Gerkan Marg + Partner

The corollary architectural aim, to stimulate and raise public awareness, will be furthered by a series of work-report lectures by local architects. It is not surprising that two of Germany's most successful architectural firms, von Gerkan Marg + Partner and Schweger + Partner, are Hamburg based along with the Anglo-German partnership of Alsop + Störmer. The Hamburg BDA has also initiated a Student Project Prize and a Baukultur Prize, for which clients who contribute to the built environment will also be eligible. Including the Architektur Prize these award events will each run on a three year cycle. In 1997 it will be the turn of the Baukultur Prize. **WA**

OnScreen



This month OnScreen *comes exclusively from Tokyo. The rapid spread of new technology within the architectural office has caused a revolution in the way architects draw, make models and send and retrieve information. It has caused us to reorganise the office and the way we work. Over the next few months* OnScreen *will present a series of diverse case studies from around the world, looking at architectural offices which are embracing these new technologies. Case studies aim to banish the mystique that surrounds the CAD System Administrator and to highlight the creative potential of the tools at our disposal.*



Practice Focus

Toyo Ito at the Mediatheque

In 1995 Toyo Ito won the competition to design a Mediatheque in the city of Sendai some 350 kilometres north of Tokyo. The project is a combination of library and city gallery which should also provide the opportunity to break down the barriers between handicapped people and the community through new media, thus creating many interesting possibilities. Ito's project is a pioneering and highly motivated response to a very social request.

Ito sees the Mediatheque as becoming a typical facility in an information-orientated society based on computer technology. As opposed to the mechanical-age architecture of the twentieth century, the Mediatheque should convey a new image of space.

The building was conceived as a series of stacked plates or diskettes, each containing a different type of media. The media plates are seen as interchangeable and are independent of each other, and thus stackable in any order. Twelve tubes pierce the plates providing space for vertical movement of people, air, energy, information, light and sound. The 23,500 square-metre project is due to start on site in August and is at present in the working drawing phase, with completion scheduled for summer 2000.

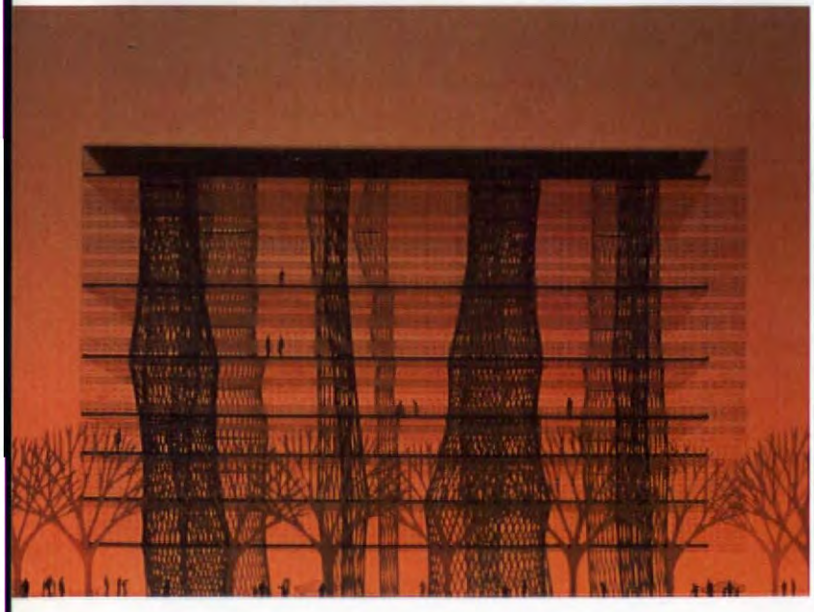
Ito's office is awash with computers ranging from 200mhz PCs and topline Power PC Macintoshs through to some older NEC 486s. HP ink jet plotters are busy on all of the three floors the office occupies. Drawing boards are hard to spot, and are now only used for layout work.

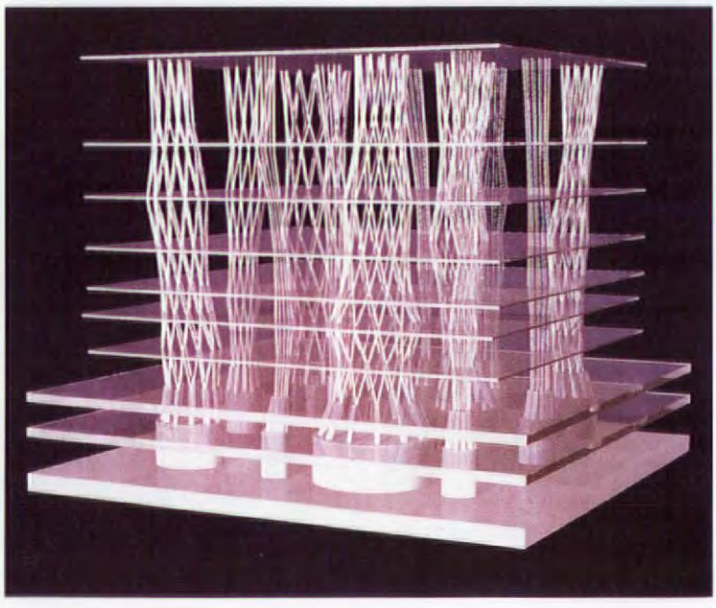
This has not always been the case.

"Eight years ago the only computer in Ito's office was a word processor."

Eight years ago the only computer in the office was a word processor. All drawings were rendered by hand on A2 trace. Due to rental values, offices are always cramped in Japan, especially in Tokyo, where Ito is based. A2 was always the *defacto* size because all the boards were A1, allowing a little space around the drawing for pencils, files, coffee cups etcetera. PCs gradually filtered into the office running early versions of Dyna CAD, and were primarily used for drawing complex roof structures. The major turning point for the office was when it entered the Jussieu Library competition in Paris. The submission drawings had to be A0 and were obviously going to be impossible to produce "manually" within the office. At this point the project had to be drawn 1:1 in virtual space on CAD, and eventually printed out.

Today most presentation drawings,





Opposite page clockwise from centre left *The engineers for Ito's Mediatheque project in the city of Sendai have refined the structure of the building by using Multiframe; competition model of the Mediatheque; rendered structural model of the Mediatheque; the structural models show how the tubular lattice columns "dance" in an earthquake to absorb the horizontal forces.* ***Below left*** *Logo for Apple's QuickDraw 3D 1.5.* ***Below right*** *Screen page from TokyoScape.* ***Bottom*** *Screen page from MetaTokyo*

and all working drawings, are CAD-based. The office still uses Dyna CAD 3 and is currently running version D for Windows. They are just evaluating version E which would run on Windows 95 and allow them to network the computers. Any 3D work is done with Macs in the office, which run a localised version of Form Z produced for the Japanese market. The engineers for the project, Sasaki Structural Engineers, are calculating the Mediatheque's structure with Multiframe for the Mac which is able to export 3D structural models. This allows Ito's office to import the true structural model into their Form Z environment where it is rendered without re-entering the data.

Working with Multiframe the engineers have been able to refine the structure so that the floor plates, a steel honeycomb structure, are only 400 millimetres thick but capable of spanning up to 15 metres. The Multiframe models show very clearly how the honeycombing mutates in an unexpected but beautiful crystalline way to pick up the structure of the lattice tubes. In the same way the structural models show how the tubular lattice columns will "dance" in an earthquake to absorb the horizontal forces. These studies have an uncanny similarity to Ito's early sketches for the building, with columns "swimming" up through the building.

Although Ito's office still sees drafting in Dyna CAD as nothing more than "drafting on a light box" they can see the potential of computers in the design process. Already they are playing a kind of "catch ball" with Form Z, sending the design back and forth between the computer and architect, searching for unexpected results. They are looking at ways to use the computer by "derailing" it from its relentless linear, logical and pre-programed path to develop new ideas of space and form. It is possible for computers to emulate our five senses of taste, touch, smell, sight, and hearing, but it is the sixth sense, the mind (of the computer) which Ito's office is challenging.

SoftwareWatch

Quick Draw 3D

Those long waits while the computer chugs away and renders your 3D model may soon be over with the release of Apple's QuickDraw 3D 1.5. QuickDraw 3D is a cross-platform application program interface, which can run on Mac OS, Windows and UNIX-based machines and will render in real-time, workstation-class 3D graphics. QuickDraw was recently awarded The Best of COMDEX.

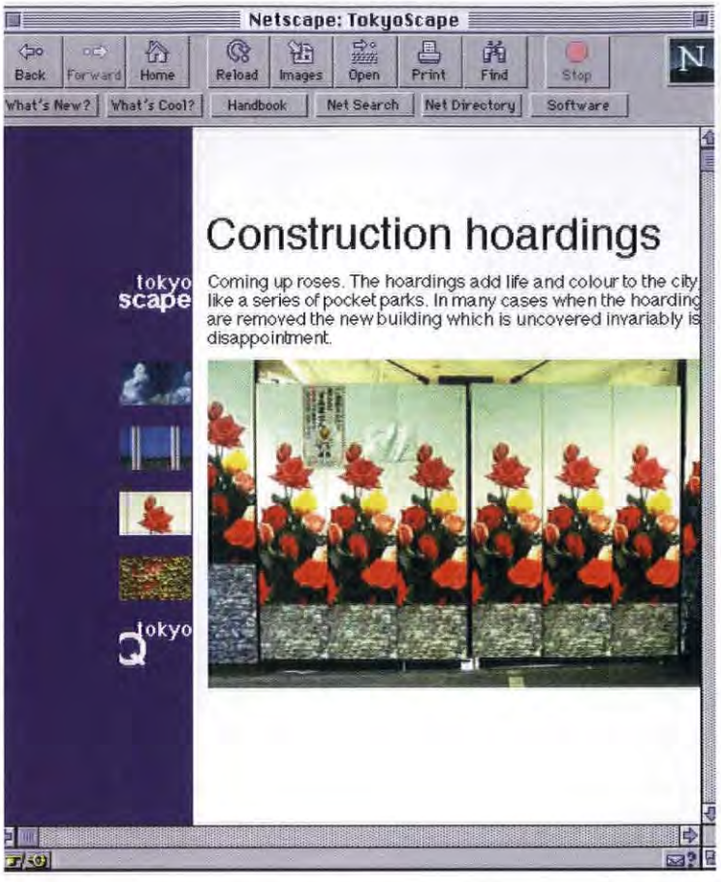
QD3D by itself consists of several libraries and extensions. Installing it without any applications will not give an end user any advantage today. But as applications that are QuickDraw 3D-savvy are released, users can expect to experience a new way of interacting with their computer. QuickDraw 3D helps users in the creation and rendering of synthetic 3D graphics, and enables previously illusive real-time interaction.

In conjunction with QuickTime VR, a very sophisticated playback engine enables users to stitch together either photographs or pre-rendered 3D scenes so that they can be "navigated" interactively. Soon applications will allow the users to seamlessly save 3D scenes as VR movies. Together the two tools will provide what is seen as a complete interactive virtual reality modelling and presentation system.

WebWatch

TokyoScape

Tokyo Q is a weekly e-zine in English about Tokyo, sponsored by Sony. Excellent city listings, restaurant and bar reviews are complemented by

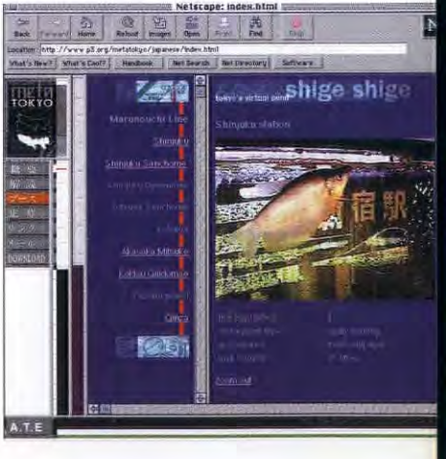


TokyoScape, a serendipidous view of Tokyo focusing each week on different "objects" within the city. Recently the digital images have ranged from police boxes to Japanese sand castles, vending machines, to the art which decorates the cardboard boxes of the homeless in one of the city's main stations. *http://www.so-net.or.jp/tokyoq*

MetaTOKYO

The metaTOKYO Project has been developed by the network of three different organisations, P3 art and environment, a University of Tokyo group known as Research into Artifacts, Center for Engineering (RACE), and NEC's Corporate Design Division.

People from various fields such as architecture, visual art, design, sociology, literature, engineering have analysed the layers that make up the city illustrating the ones which are most visible through their eyes.
http://www.p3.org/metatokyo/



Mark Dytham, World Architecture's *new* OnScreen *correspondent, is a partner of Klein Dytham architects, based in Tokyo. He can be contacted via* WA *or on Tel/Fax: +81 3 3796 1709; or e-mail: zapkdarc@gol.com*

Events

LECTURES, CONGRESSES AND CONFERENCES

AUSTRALIA

Biennial Oceanic Architecture and Design Student Conference International student conference to be held at Deakin University, from 6-11 July 1997. Contact Carlie Spiteri, School of Architecture and Building, Deakin University, Woolstores Campus, Geelong, Victoria 3217, Australia. Tel: +61 3 5227 8364. Fax: +61 3 5227 8365. e-mail: morphe@deakin.edu.au. Web:http://www.ab.deakin.edu.au/morphe/morphe.html

BULGARIA

INTERARCH '97 VII World Triennial of Architecture Organised by the International Academy of Architecture (IAA) and the Union of Bulgarian Architects, the Triennial will consist of a symposium and an exhibition focusing on architectural education in the twenty-first century . From 23-29 June 1997 at 2 Tzar Osvoboditel Blvd, Sofia 1000, Bulgaria. Contact Milka Kostourkova. Tel: +35 92 9872931/9871313. Fax: +35 92 9877165

JAPAN

Le Corbusier in Japan An international meeting about the architect's relationship with Japan. 7 February 1997 - 10 February 1997. contact The museum of Modern Art, Yasuto Ota, 2-1-53 Yukinoshita, Kamakura, 248, Kanagawa, Japan. Tel: +81 467 225000. Fax: +81 467 232464

POLAND

Challenges to Civil and Mechanical Engineering in 2000 and Beyond A Council for Tall Buildings and Urban Habitat (CTBUH) -endorsed conference to be held at the Technival University of Wroclaw, from 2-7 June 1997. Themes include an analysis of twentieth century achievements in engineering and required changes at the turn of the millennium. Contact Secretariat of Conference CCME 97, Technical University of Wroclaw, Institute of Building Engineering, Wybrzeze Wyspianskiego 27, 50-370 Wroclaw, Poland. Tel: +48 71 320 3721. Fax: +48 71 22 14 65. e-mail: kobielak@pioneer.ib.pwr.wroc.pl

THAILAND

Annual conference/exhibition of the Association of Siamese Architects 27-30 March 1997. Queen Sirikit National Convention Centre, Bangkok, Thailand. For further information telephone +66 2 319 4124. Fax: +66 2 319 6410

UK

Portable Architecture The Portable Buildings Research Unit of the University of Liverpool are calling for papers on the application of demountable and portable building systems in preparation for a conference on 30-31 May 1997. Contact University of Liverpool, School of Architecture and Building Engineering, Leverhulme Building, Abercromby Square, Liverpool L69 3BX, UK. Tel: +44 151 794 2604. Fax: +44 151 794 2605. e-mail: paconfex @liv.ac.uk. Web: http://www.liv.ac.uk/~paconfex/home.html

Nationality and Scottish Architecture A symposium investigating the nature of Scottish architecture, its claims to uniqueness and the sources from which it derives its character. Organised by the Architectural Heritage Society of Scotland, and held at the Edinburgh College of Art, Lauriston Place, Edinburgh EH3 9DY, UK. Symposium runs from 21-23 March 1997. Tel: +44 131 221 6000

ARCHITECTURE AND DESIGN COMPETITIONS

GERMANY

Techtextil 1997: Textile structures for new building The working Group for Technical Textiles, in connection with the International Trade Fair for Technical Textiles (13-15 May 1997) are holding a competition open to students of architecture and construction engineering. Entries must be submitted by 7 March 1997. For further information contact Mr Michael Jänecke, Ludwig-Erhard-Anlage 1, D-60327 Frankfurt am Main, Germany. Tel: +49 69 7575 6578. Fax: +49 69 7575 6710

GREECE

The Cultural Capital of Europe, Thessaloniki 1997 A competition requiring European professionals in the fields of urbanism and architecture, under the age of 45, to design modern architectural and landscape projects to be inscribed within the existing cityscape of Thessaloniki. Registration until 21 February 1997. Contact EUROPAN/ THESSALONIKI 1997, the Organisation for the Cultural Capital of Europe, 105 Vassisissis Olgas av, 546 43 Thessaloniki, Greece. Tel: +30 93 268143. Fax: +30 31 86 7870

ITALY

Grand Prix Ceramica Casalgrande-Padana International award for professionals who have used either Granitogres or Marmogres porcelain tiles in projects completed between 1994 and 1997. Deadline 31 July 1997. For further information contact Grand Prix, c/o Ceramica Casalgrande-Padana, Strada Statale 467 n 73, 42013, Casalgrande (RE), Italy. Tel: +39 522 9901. Fax: +39 522 996121

JAPAN

8th International Design Competition In quest of spiritual comfort and the relaxation of the mind. Total prize money US$71,000. Deadline for preliminary screening 2 December 1996. Preliminary screening 5-7 March 1997. Citation ceremony and exhibition October 1997. Contact Mr Fukunaga and Ms Sako, Japan Design Foundation, Osaka Ekimae Dai-ichi Building 8F, 3-1-800 Umeda, Kitaku, Osaka 530, Japan. Tel: +81 6 346 2611. Fax: +81 6 346 2615

SENEGAL

Design of the Gorée Memorial, Dakar, Senegal The competition, sponsored by the Organisation for African Unity and open to all, is dedicated to the creation of the 12,000 square metre Gorée Memorial: a museum complex and information/research centre at the cove of the Madeleines, Dakar. The jury includes Christian de Portzamparc, Carolyn Armenta Davis and Suk-Won Kang. Deadline for the reception of applications 20 February 1997. The jury will meet in July. Documents, in French or English, must be submitted UIA General Secretariat, 51 rue Raynouard, 75016 Paris, France. Tel: +33 1 45 24 36 88. Fax: +33 1 45 24 02 78. e-mail: uia@uia-architectes.org

UK

The 1997 Benedictus Awards Architects who have designed commericial or residential projects incorporating laminated glass in an innovative manner are invited to submit portfolios for the 1997 Benedictus Award. Entry 3 March 1997/registration 7 March 1997. Contact Toni Elston. Tel: +44 1442 346531 or DuPont Benedictus Awards. e-mail: haneslahr@mci.com

EXHIBITIONS

AUSTRIA

Turning Point An exhibition by Philip Johnson comprising his *Wiener Trio* – a three part object arranged in order "to make space accessible". Until 23 March 1997. Austrian Museum of Applied Art (MAK), Stubenring 5, A-1010 Vienna, Austria. Contact Christina Werner. Tel: +43 1 71136 233. Fax: +43 1 713 10 26

HONG KONG

Monument 1997 Hong Kong International Ideas Competiton. Organised by the HKIA, the exhibition of the competition entrants will run from 13-18 February 1997 at the Hong Kong Arts Centre. For further information contact the HKIA. Tel: +852 2511 6323. Fax: +44 2519 6011

THE NETHERLANDS

The Netherlands Goes to School Two centuries of school construction. Until February 1997. Netherlands Architecture Institute (NAI), Museumpark 25, 3015 CB Rotterdam, The Netherlands. Tel: +31 10 440 12 00. Fax: +31 10 436 69 75

SWEDEN

Rafael Moneo An exhibition of the architect's designs for the new Swedish Museum of Architecture and the new Museum of Modern Art, in Stockholm, Sweden. Until 10 February 1998. Contact Catharina Siegbahn at Arkitektur Museet, Skeppsholmen, S 11149 Stockholm, Sweden. Tel: +46 8 463 0500. Fax: +46 8 611 47 61

UK

Charlotte Perriand: Modernist Pioneer Retrospective of the influential French designer's long career. Until April 1997. The Design Museum, Shad Thames, London SE1 2YD, UK. Tel: +44 171 378 6055

The Architect of Floors: modernism, art and Marion Dorn designs Retrospective of the American born designer whose relocation to the UK in 1923 helped shape British attitudes towards design, as a creative medium. Until 6 April 1997 at the Whitworth Art Gallery, Manchester, UK. Contact Penny Hamilton. Tel: +44 161 275 7450. Fax: +44. e-mail: Whitworth@man.ac.uk

Denys Lasdun A comprehensive retrospective of Lasdun's career, which coincides with the rise, fall and rebirth of modernist principles in twentieth century architecture. Until 16 March 1997 at the Royal Academy of Arts. Contact Katherine Jones, Piccadilly, London, W1V ODS. Tel: +44 171 494 5615. Fax: +44 171 439 4998

Spinning Light and Turning Tables An exhibition of new lighting and furniture constructs by Ralph Ball. Until 27 February 1997. Concord Gallery, 174 High Holborn, London, WC1V 7AA, UK. Tel: +44 171 497 1400

Romanian Architecture of the Twenties and Thirties Until 26 March 1996. RIBA Architecture Centre, 66 Portland Place, London W1N 4AD, London, UK. Tel: +44 171 580 5533. Fax: +44 171 637 5775

Contemporary Norwegian Architecture Until 12 April. RIBA Architecture Centre, 66 Portland Place, London W1N 4AD, London, UK. Tel: +44 171 580 5533. Fax: +44 171 637 5775

USA

An American Embassy in Berlin An exhibition examining the recent competition for a new American Embassy in Berlin. The exhibition will focus on the winning entry by Moore Ruble Yudell and Gruen Associates. Until 23 February 1997. Contact Elly Muller or Lisa Eddy at the National Building Museum, 410 F Street NW, Washington DC 20001, USA. Tel: +202 272 3606 or 272 2448. Fax: +202 272 2564

Go Out Into The Streets: views of the city from the Washington Print Club Until 30 March 1997. An exhibition depicting visions of urban life through a range of prints, ranging from Giambattista Piranesi to Richard Estes. Contact Elly Muller or Lisa Eddy at the National Building Museum, 410 F Street NW, Washington DC 20001, USA. Tel: +202 272 3606 or 272 2448. Fax: +202 272 2564

Josef Paul Kleihues: Projecting the Museum of Contemporary Art (MCA) Until February 1997. MCA, 220 East Chicago Avenue, Chicago, USA. Tel: +312 280 2660

TRADE SHOWS

FRANCE

Euro City 97 An exhibition of products for the urban environment to be held at Parc des Expositions de Paris, Porte de Versailles, 75015, Paris, France. 3-5 June 1997. Contact Caterina Proietti, Euro City 97, Hereford House, Bridle Path, Croydon, Surrey CR9 4NL, UK. Tel: +44 181 6804200. Fax: +44 181 6815049

JORDAN

PAX 97 The first international construction exhibition to be held in Jordan. The venue is the Amman International Exhibition Hall, Amman, Jordan. The event runs from 5-8 May 1997. For further information tel: +962 6612825/6. Fax: +962 6633090

PORTUGAL

ICSC-Europe 22nd Annual Conference, Leasing and Trade Fair 17-19 April 1997 Lisbon, Portugal. For all further information contact Tessa Kilgour at ICSE-Europe, 37 Pottery Lane, London W11 4LY, UK. Tel: +44 171 727 3935. Fax: +44 171 727 6081

RUSSIA

Batimat MosBuild 97 Moscow's third international building exhibition will be held at the Krasnaya Presnya Expocentr, Moscow, Russia from the 12-15 March 1997. Contact Constantine Bridgeman. Tel: +7 502 221 3350. Fax: +7 502 221 3351

UK

ICAT 97 – Integrating CAD-CAM (formerly the CADCAM show) Application areas include mechanical, manufacturing, process, electrical, electronic, architecture and construction. 4-6 March 1997. NEC Birmingham, UK. For further information contact Lisa Parrett. Tel: +44 171 208 5020

USA

COVERINGS Four-day event encompassing three separate expositions and conferences – the International Flooring Exposition (IFE), the International Tile & Stone Exposition (ITSE) and the International Wall Coverings Exposition (IWCE) – running from 23-26 April 1997. The event will be held in Orlando, Florida. For further information contact COVERINGS 900E Indiatown Road, Suite 207, Jupiter, FL 33477. Tel: +561 747 9400. Fax: +561 747 9466

Mexico: waiting to rebound

Just three years ago, as the North American Free Trade Agreement (NAFTA) came into force, Mexico's appetite for new buildings seemed almost limitless. In the wake of NAFTA, scores of major office buildings, hotels, and multi-use projects were announced as optimism swept through the country. But when the peso crashed in December 1994, new construction virtually ground to a halt. Most Mexican architects struggled to keep afloat, while many foreign firms withdrew from Mexico altogether. Although key economic and political clouds still hover, the construction sector is gradually showing signs of recovery as some foreign firms consider returning to Mexico to preempt the competition. Paul Sherman, *Time*'s Mexico correspondent reports on the economic and political issues facing Mexican architecture as it begins to re-emerge on the architectural map.

NAFTA brought down most tariffs and trade barriers between Mexico, the United States and Canada. The Mexican government was encouraged to open up many areas of its economy, including construction, to much greater participation of foreign capital than ever before. The privatisation of Mexican banks in the early 1990s, and the relatively low interest rates at the time, when compared to the 1980s, helped create a major new source of capital for architectural projects. With new and more attractive investment laws in place and abundant optimism, the construction sector out-paced the economy as a whole during this period. Foreign developers and architectural firms were flocking to Mexico, pledging billions of dollars in new construction projects that were much larger in scale than anything the country had seen before. "Many Mexicans were saying, 'Look we are now in the First World so we need to look like the First World'" said Eduardo Torreblanca, a Mexico City economic analyst. "The country went on a building binge."

After devaluation

When the peso crashed in December 1994 the construction boom came to an abrupt and painful end. Interest rates shot up to over 100 percent for a brief period as foreign capital fled the country and gross domestic product tumbled. Confidence in the Mexican economy evaporated, as the peso lost its much-touted stability that had attracted many investors who had judged Mexico too risky in the past. All across Mexico ambitious developments were put on hold – everything from major hotels to shopping centres and mixed-use projects. The construction industry was one of the hardest hit sectors in the Mexican economy. "These have been the most difficult two years I have seen in my 25 years in the business," said José Grinberg, a Mexico City architect. "Almost everything is on hold." In 1995 GDP fell by seven percent for the country as a whole, with construction falling a staggering 22 percent. From 1990 to 1994, direct foreign investment in the construction sector averaged US$161 million a year, while in 1995 that number fell to US$16 million. The building that did continue after the devaluation was primarily focused on projects that had already begun before 1995, including Arcos Bosques (featured in this issue), a number of hotels (including Mexico City's new JB Marriott Hotel and Crowne Plaza), and several buildings in the Santa Fe development. "There really weren't any important new projects started in 1995 or 1996," said Miguel Adria, a Spanish architecture critic in Mexico. "They are lost years."

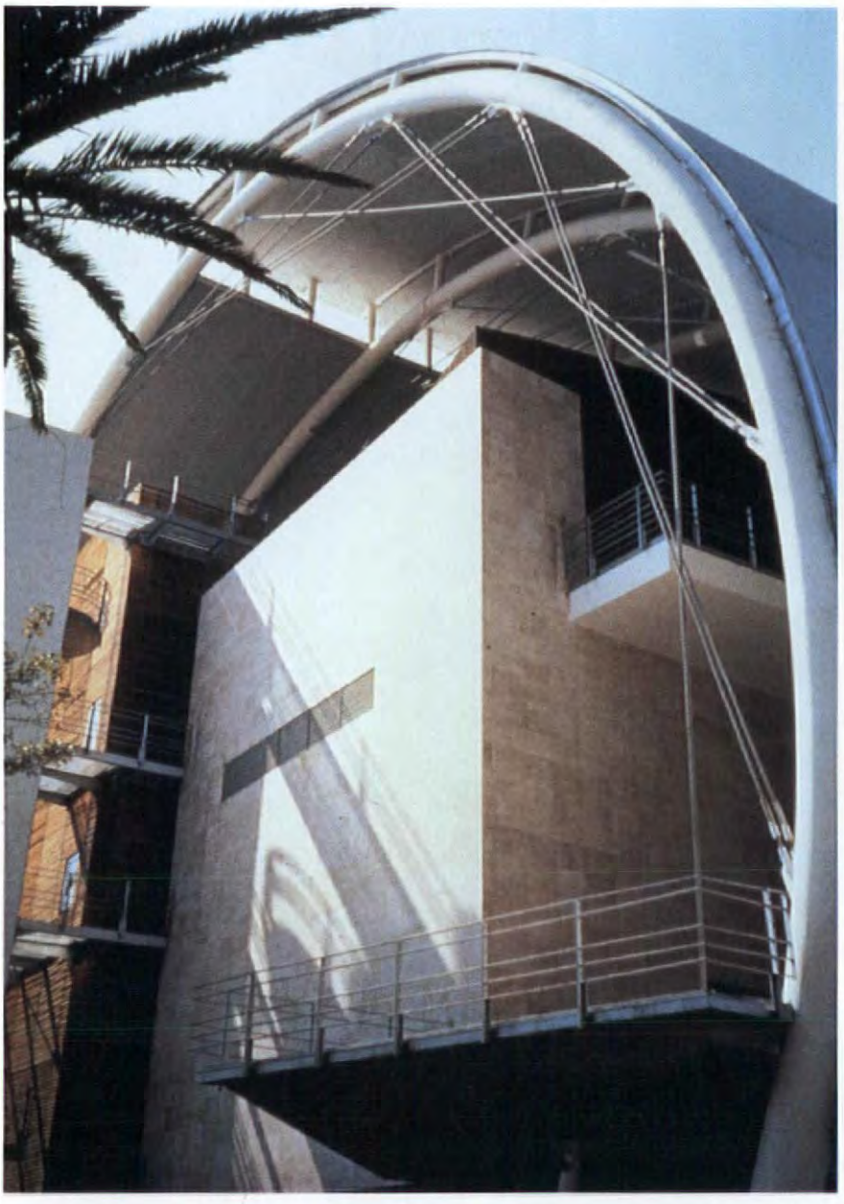
Foreign Firms and NAFTA

Just before the implementation of NAFTA, there was a wave of speculation over whether the trade pact would radically open up Mexico to foreign architects. To date, the trade pact has had more of an indirect influence on architecture in Mexico by changing the economy, and a much more modest effect on the practice of architecture itself. Despite changes in Mexico's laws that denied non-Mexican citizens and non-residents from practicing in Mexico, professional certification, called the *cedula* in Spanish, still effectively prevents almost all foreigners from practicing in the country. In order to receive such certification in Mexico, an architect must have received a diploma from a Mexican university. However, this is slowly changing. Currently, there is a committee made up of architects from the three member countries that meets regularly to try to stimulate closer ties, and to facilitate cross-border work by architects. Sam Balen, executive vice president at the Fellowship of American Institute of Architects, and a member of the NAFTA committee, said that hopefully by the autumn of 1997 an agreement will be in place whereby Mexico will accept professional certification in the US to enable Americans to practice in Mexico, and vice versa. Even with NAFTA, there are still important cultural differences, separate from any laws and treaties, that play a critical role for the practice of architecture in Mexico. Currently, only two foreign architectural firms have a permanent presence in Mexico: Hellmuth, Obata and Kassabaum (HOK) and Kaplin McGollughan and Diaz (KMD). They both find that working from within Mexico has its advantages. In the case of HOK, (see Face to face) they hope that their presence in Mexico during the crisis will help them establish recognition in the country.

Foreign involvement in real estate

Real estate in Mexico is subject to a trust agreement mechanism agreed under the Mexican constitution: for example, to circumvent the prohibition of foreigners purchasing real estate in the restricted zone, a strip of land 50 kilometres from the borders, for residential purposes, foreign individuals or entities may enter into *fideicomiso* (trust agreement).

Luis Gordoa



Luis Gordoa

Above *Abraham Zabludovsky's Sor Juana Inés de la Cruz Cultural Center, Nepantla, Mexico State, shown at the VI International Architecture Exhibition in Venice Biennale.* ***Left*** *Enrique Norten's National School of Theatre, Mexico DF. The City of Arts, in which it stands, was conceived as President Salinas' "Grand Project". Mexican architects such as Ricardo Legorreta, Enrique Norten, Sordo Magdelano and Teodoro González de León were commissioned to design buildings that were largely completed in 1994 towards the end of Salinas' time in office and before the December devaluation crisis. The City of Arts has been modestly successful although it has been criticised for an unnatural concentration of arts in an inaccessible suburb of Mexico City and, because of the rush for completion, the lack of consultation with relevant student bodies has led to a conflict between form and function in some areas*

Bureaucracy

Many foreign architects who hoped that NAFTA would completely end the bureaucratic and political problems that builders face in Mexico have been disappointed. As a result, most foreign firms doing projects in Mexico still have – and need – joint ventures or links to Mexican firms. "I'd say all international companies need a representative in Mexico who knows how to navigate through the government's paperwork," said Ricardo Saslavsky, the publisher of *Enlace*, Mexico's largest architectural magazine. "There are key cultural factors that only a local firm can deal with." The paperwork in Mexico can be intensely burdensome depending on the project. Generally projects in large industrial parks or government-run tourist resorts will have less problems than independent projects that often require the approval of a whole series of different levels of the government, from the local municipal office all the way up to federal ministries. The federal government also sets a whole series of building codes – called *Normas Oficiales Mexicanas* in Spanish (NOMs) – that regulate everything from plumbing and electrical needs to environmental requirements. "The laws are one thing, and the reality is another," said Issac Broid, a Mexico City architect, who notes that foreign architects need Mexican contacts to help them deal with a wide range of practical issues from meeting with government officials to negotiating with ministries. "It's all about know-how," he says. "Each country has its own way of doing things, and Mexico is no different."

Politics and architecture

In July 1997, congressional elections will be held across Mexico, and perhaps more importantly for architects, voters in Mexico City – a city of some 17 million people that accounts for nearly half of all construction in the country – will elect their governor for the first time in history. A change in local government could have far-reaching effects on everything from zoning and public infrastructure to urban planning. Although there is a certain amount of continuity in the fact that the Institutional Revolutionary Party (PRI) has controlled almost all levels of Mexican government for nearly 67 years, many developers say that they are waiting until after the mid-term elections to begin thinking about new projects because of uncertainty over who will win, and more importantly about how the overall process will effect both the economy and the stability of the country. "Next year is very important because of the Mexico City election," said one Mexico City architect. "The process of the elections is more important than which political party wins." In recent years, elections have provoked instability in Mexico, with the economy and long-term projects often suffering. "We are living the birth of a new democracy, and births are always painful," said Enrique Norten, Mexico's most noted hi-tech architect. Mexican architecture has always been greatly effected by the country's paramount political cycle: the six-year presidential terms. Throughout 67 years of continuous rule by the PRI, the single, six-year term of the president, called the *sexsenio*, has effected all areas of society. For years the conventional wisdom for architects has been that the first two years of a presidential term are slow for construction, as the new administration begins its projects. This is followed by an increase in building in the third, fourth, and

Arturo Arditti

Timothy Hursley

Above *Topelson & Grinberg Arquitectos' Coyacán Community Centre, Mexico City, evolved through establishing a dialogue with the local community.* ***Above right*** *Arditti & Arditti Arquitectos' Junior Club House, Bellavista community, Calacoaya, A multi-use sports facility complex with cafeteria.* ***Right*** *Santa Fe is a suburban landfill site which recently developed as an important commercial area. HOK's Centro Commercial mall is in the centre foreground*

fifth years of the administration as the projects get underway. And finally, in the last year of the term, building drops off again as projects are finished just in time for the president to leave office; then the cycle starts all over again with the new president. This was certainly the case for the last administration, as architects were forced to finish projects quickly, often at the expense of quality (for instance the National Arts Center in Mexico City), in order to finish while Salinas was still in power.

Government plans for construction

In the wake of the devaluation, the Government has curtailed its new building projects as part of sharp spending cuts last year. In the early 1990s, the Government was a major influence on the construction boom, spending lavishly on new museums and schools, office parks and government buildings. But now the Government has a much more diminished role because of fiscal cutbacks, although there will be a slight increase in the budget next year. As a result, the state is now unable to play the role of catalyst to the construction sector, at least not in the short term. The Government has pledged to maintain a strict spending regime with only a limited fiscal deficit expected in 1997. "Because of budgetary cutbacks, the Government has had to re-focus its building projects to only those projects that directly effect the most amount of people," said Juan Gil Elizondo, the secretary of urban development and housing for Mexico City. This means that the government will spend less money on aesthetic and cultural projects, and direct more of its resources towards basic infrastructure including transportation, schools, hospitals and housing.

Housing

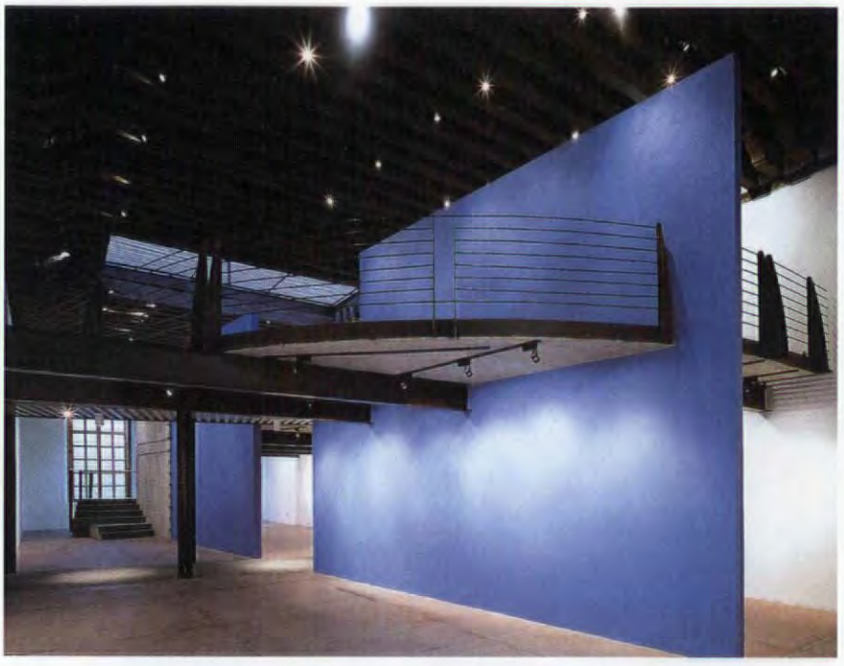
More housing is one of the most desperate needs of the Mexican population. Some studies show that up to six million new houses are needed to meet the increase in Mexico's very young population. But the housing sector has been badly effected by devaluation and banking problems. Prior to the devaluation some US home builders – including Maryland-based Tyland Group, Los Angeles-based Kaufman & Broad, and Houston's Centex – considered entering the Mexican home building market. But since the peso devaluation, private sector housing construction has fallen dramatically, as have Government programmes in this area. The banking crisis has taken a terrible toll on Mexicans' ability to buy new houses. Even two years after the devaluation, the vast majority of citizens are unable to get a mortgage. Many architects have also rejected doing work for the lower income housing market because of the small pay off. But others are starting to focus on the social importance of well-planned housing projects, especially as Mexico becomes increasingly urbanised. "Most architects forget about the people," said José Grinberg, who has developed a number of housing and residential revitalisation projects in some of the most impoverished areas of downtown Mexico City. "These are the projects that I feel will give life to our communities."

Transport

One area that the government has not cut back on significantly is the transportation sector because of its importance to the economy as a whole, and to the quality of life of its citizens.

Timothy Hursley

Luis Gordoa



Left *Picciotto Arquitectos' Cenit Plaza Arquímedes one of the last big pre-devaluation speculative projects to be finished before the recession.* ***Above left*** *The lobby of HOK's Reforma 265, Mexico City for the Mexican development company, Levy, Harari, Breceda (LHB). HOK's redesign increased the usable area of the floors of the existing tower by six percent.* ***Above*** *Issac Broid's Zajman's Centre for the Image, Mexico DF is an intervention within the former military barracks of La Cuidadela on the edge of the historic centre of Mexico City. The materials employed contrast with those of the original fabric providing an ultra-modern setting.*

Opposite left *Hotel Westin Regina, Los Cabos, Cerro Colorado, Baja California by Sordo Magdeleno y Asociados, Javier Sordo Madaleno Bringas, and José de Yturbe Bernal arquitectos – designed according to the topography, the landscape and the climate. The scheme creates an temperate microclimate inside a great curving wall which accommodates the guest rooms.* ***Opposite right*** *De Yturbe Arquitectos' Fiesta Americana Villas Cozumel on the Caribbean island of Cozumel. Using local materials the architects reinterpreted the typical palapa house*

Next year the government is expected to announce the location for the building of Mexico City's second airport, that will not be operational until well after the year 2000. The two likely locations are the town of Texcoco in the north east of the city or a rural area in the state of Hidalgo to the east. Airport projects for cities of Monterrey, Tijuana, Cancun and Guadalajara area also going forward. In Mexico City, new metro lines and above-ground tram systems are also continuing, although a little slower than before. The privatisation of Mexico's rail system is moving forward, with many foreign firms taking part in the bidding process. The country's highway programme is slowly trying to re-attract private investment after an ill-planned scheme resulted in billions of dollars in government bailouts during the last administration.

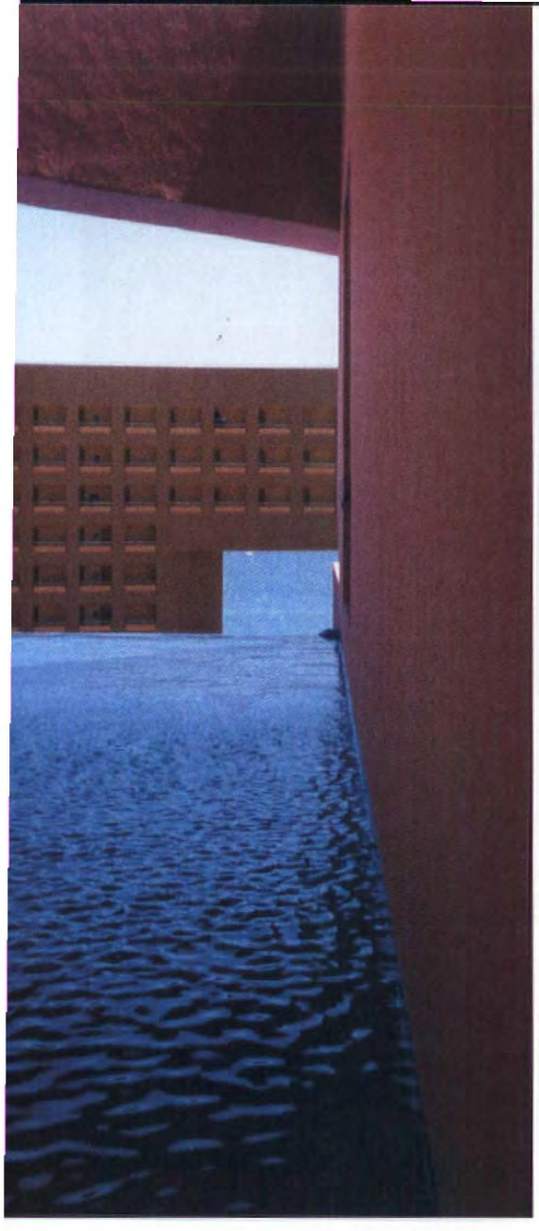
Offices

Even before the peso crash, Mexico was already facing a glut of office space. In fact a story in *The Wall Street Journal* written in 1993, a full year before the economic crisis, was titled "NAFTA Fever Leaves Mexico Overbuilt." At the time, vacancy rates for prime Mexico City offices were extremely high, as more and more builders moved in with visions of massive office complexes. Even the white elephant of Mexico City, a massive unfinished 40-storey building on one of Mexico's most important streets, was transformed into Mexico's largest office building – now called the World Trade Center – after standing vacant and without walls for over 25 years. The government of Carlos Salinas de Gortari was instrumental in coordinating a number of the most important development projects that attracted foreign capital. The largest of these was Santa Fe, the most extensive real estate project in Latin America at the time. This 1,600-acre project about eight miles from the financial centre of Mexico City became a symbol of the "New Mexico" that was being built. It transformed what had once been a major refuse dump into a deluxe office, commercial and residential complex. Among the major investors who pledged to build in this area were the Reichmann brothers who have now put their plans on hold because of devaluation (see insert). So when the peso was devalued, and the economy tanked, office space suffered tremendously. Today, there is still over half a million square metres of prime office space lying empty. The price for such office space has also fallen sharply, from about US$35 in 1994, to about US$25 per square metre now. Real estate analysts estimate that the price of office space in Mexico City will probably not recover its 1994 level until 1998. As a result, large-scale office buildings are not likely to be built in the next year or two.

Tourism

Tourism is Mexico's third largest foreign exchange earner, behind oil and manufactured goods. A joint study by the World Travel and Tourism Council and the American Express Foundation predicts a 160 percent increase in Mexico's tourism income between 1996 and 2006. (See table showing the popularity of different areas opposite).

Mexico's "sun, sea and sand" resorts can be divided into two categories: the traditional beach resorts (including Puerto Vallarta, Mazatlán, Manzanillo, Acapulco) and modern, planned mega-resorts developed by the National Tourism Development Fund, FONATUR. For the mega-resorts, FONATUR develops the basic infrastructure, roads, harbors, etcetera and private investors build hotels, restaurants and other tourist-oriented services. To date, FONATUR has developed



Fernando Corderro

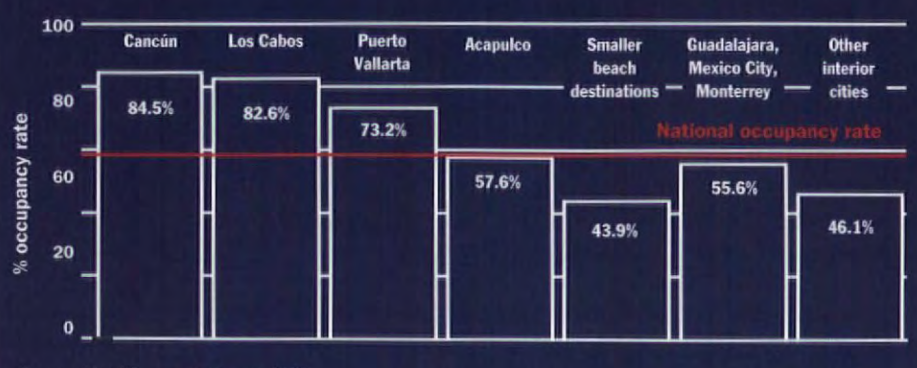
five such mega-resorts – Cancún, Ixtapa, Los Cabos, Loreto-Nopolo and Huatulco Bays. Cancún, off the north eastern tip of the Yucatan peninsula was FONATUR's first project and it has become the country's premier tourist resort with 20,000-plus hotel rooms in over 100 hotels. The city's airport is now the country's second largest in terms of passengers used by 4.8 million visitors in 1996. Cancún remains a magnet for all tourist-related activities. The first Wet & Wild Aquatic Park opened earlier this year to be followed by similar parks in Puerto Vallarta, Acapulco, Los Cabos and Mexico City.

Los Cabos, at the southern tip of the Baja peninsula, is poised to become an exclusive world-class golfing centre, Mexico's answer to Palm Springs. The US has six million golfers so the attraction of a golfing centre with guaranteed sunshine only a few hours south is undeniable. A US developer, Donald Koll, controls both the Palmilla Hotels with its adjoining Jack Nicklaus-designed championship golf course and the Cabo del Sol development – a joint venture with Grupo ICA featuring three golf courses, 2,000 hotel rooms and 34,000 homes. Los Cabos, with its sports facilities and abundance of luxury hotel rooms and ocean-view condominiums, looks set to continue growing well into the next century.

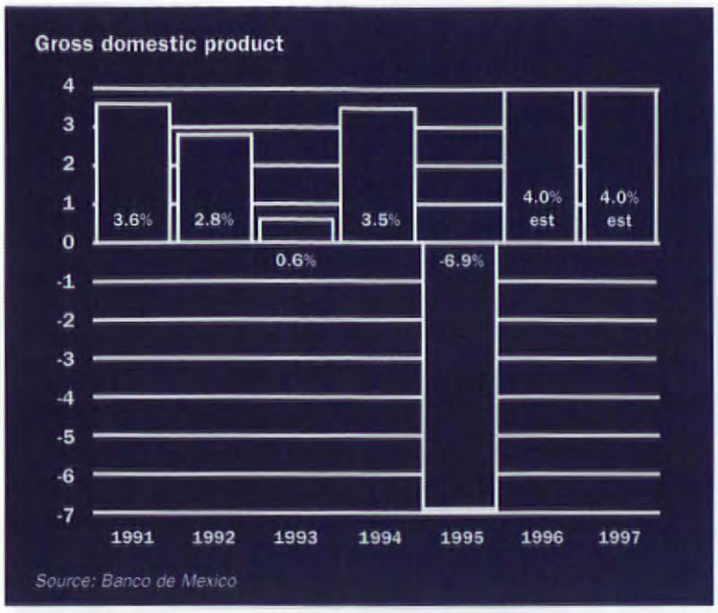
FONATUR's newest mega-resort, Huatulco, begun in 1983, now has 2,000 rooms in 20 hotels. Huatulco's occupancy rate over winter 1996 was close to 90 percent with the majority of visitors arriving on charter flights, 80 percent of them from the US. To overcome problems caused by reliance on charter flights an innovative risk sharing deal was agreed with Continental and Mexicana airlines. The Huatulco Hotel Association backed by SECTUR and FONATUR and the Oaxaca State Government has guaranteed that the airlines will at least break even on their scheduled routes to Huatulco. Will Huatulco fly? Hopes are high and development projects are expected through to 2018.

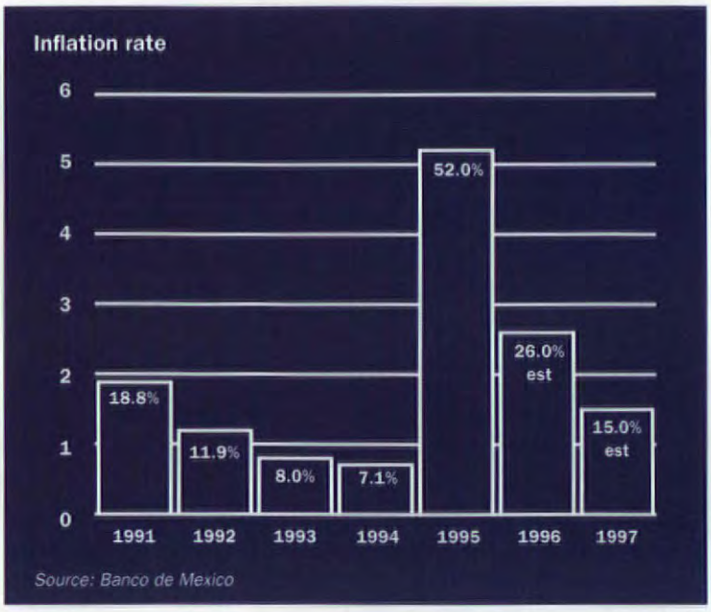
Several hotel chains are expanding: Westin Hotels and Resorts is looking for two new properties to add to those it already has in Cancún, Puerto Vallarta, Acapulco, Mexico

Occupancy levels in resort areas indicating popularity and potential



Source: Lloyd Economic Report 1996





City, Ixtapa and Los Cabos. The Canadian realty firm, La Salle Partner hopes to spend C$250m to purchase 13 hotels in prime tourist destinations. The purchases will form part of an investment package prepared by La Salle for overseas pension funds and insurance companies. Grupo Posadas (Fiesta Americana and Fiesta Inn chains) increased its hotel rooms by 1,100 during 1995. The group now has 40 hotels in Mexico, the US and Venezuela, and aims to double this number in five years, partly through a joint venture with Morgan Stanley Real Estate.

Shopping centres

During the boom years, Mexico City built about half a dozen major shopping centres, and dozens of smaller ones. The largest was in the Santa Fe project. Major malls, based on US designs, were built primarily in the south of the city. Major international retail firms started moving in as Wal-Marts, K-Marts and Price Clubs became part of Mexico City's new urban landscape, generally bringing their architectural work from abroad. Since the peso crash retail sales have plummeted in Mexico. Even in 1996 as some sectors like construction started to improve, the retail sector still remained flat. As a result, shopping centres have faced hard times, as many retailers have closed up shop altogther. However, there is one project going forward in the Polanco neighbourhood. Architect Sordo Madaleno is working on the massive "Moliere 333" shopping mall in a prime, centrally-located area of the city. With three levels of stores, it will undoubtedly be one of Mexico's fanciest new malls. But the question is: will the developers be able to find stores to fill the huge space? Many architects doubt whether there is a market for yet another mall. "We have three or four too many malls as it is," said one Mexico City architect. But the developers of Moliere 333 are betting that when the economy rebounds, the prime, central location of the mall will make the risk of building in a down market pay off.

Export based manufacturing

The engine for the Mexican economy is its export sector that has thrived because of the fall in the peso which makes Mexican exports much more competitive abroad. *Maquiladoras* (in-bond assembly plants) concentrated along the US-Mexican border have grown sharply since the devaluation as industrial parks attracting these plants thrive. In fact, Tijuana,

Reichmann

In late 1994, in the words of Reichmann's International vice president Daniel Haggarty, the "stars were all aligning" on a number of major projects for his firm in Mexico City. At the time, Canadian-based Reichmann International was planning to develop three of Mexico City's most important projects: the Alameda Project in downtown Mexico City, a massive office tower called "Reforma en Chapultepec" on the city's most important boulevard, and a major multi-use development in the Santa Fe project. As NAFTA came into force, the Reichmanns were getting ready to start breaking ground on the projects along with their Mexican partner ICA, one of the country's most important construction companies. The developments would have been worth over a billion dollars. But then in late 1994 the peso crashed, pulling the Mexican economy down with it. "In 1994, we were just about ready to go," said Haggarty. "Then, the peso devalued. It was like an earthquake. So we decided that everything would be put on hold for one year." The holding pattern has since been extended indefinitely on the projects until the macro economics of Mexico becomes clearer again. Models of the elaborate projects still fill a foyer in the Reichmann offices in the Polanco neighborhood of Mexico City, a reminder of what could have been, but also what is still to come. The company has no firm date when it will start any of the three projects – an improvement in the country's banking system, retail sector, and office market will decide that. Some Mexican architects even doubt whether the projects will ever be developed as they are, but Haggarty is adamant that they are only temporarily on hold. "It's just a question of timing," he says. "We are looking at the long term. The question now is when is the best time to start these projects again?" And it is not just economics, but also politics that will play an important role in these developments, especially the Alameda project because of the key role of the government in everything from zoning to dealing with local residents. As a result, next summer's mayoral elections in Mexico City will be an important factor affecting the Reichmann's next move. "We are partners with the government on the Alameda project. I look at this as a public-private partnership," he says. "We can't do it all by ourselves." Mexican architect Ricardo Legorreta designed the master plan for the Alameda project, but the project will change depending on Mexico's real estate market; it could include more retail space, more offices or more hotels rooms depending on economic conditions. Haggarty says that the final project of nearly a dozen different buildings will probably be commissioned by about six different architects, half Mexican and the other half international. "We want to mix it up," he said. "We aren't going to give the entire project to one architect. We want it to look diverse."

Alejandro Zohn's Libertad Market, Guadalajara

across the border from San Diego, is now the colour television-producing capital of the world. Japanese, US and Korean firms continue to flood into the north of the country, unfazed, and even helped by the peso devaluation. The potential for factory design for architects is small. The border area is also a strong area for foreign architectural firms. Architects in San Diego work with counterparts in Tijuana, and likewise, firms in El Paso, work with firms in neighboring Ciudad Juarez.

Next generation of Mexican architects

The crisis has certainly taken a hard toll on Mexican architects. Even the most respected practices have scrambled to get by. "Many young firms were killed off by the economic crisis. It has totally decapitated a generation of architects," said Enrique Norten. "That will cost the profession an enormous amount in terms of quality and talent in the years to come." Many top architects shifted their focus abroad, working on commissions and competitions in foreign countries. Others, have turned to teaching as a means of lasting out the crisis. HOK is increasingly doing work for their affiliates in other countries, including work for their Hong Kong office for a project in India. For young architects coming out of school, the crisis has meant that there are almost no entry level positions. They, like the developers, are eagerly waiting for an improvement in the macro economic outlook.

Long-term fundamentals still strong

Even in the worst days of the recession, there was generally an optimism that through its ties to the US economy and its free-market reforms, the Mexican economy would rebound. The international US$52 billion aid package made available to Mexico, that was strongly supported by the US, sent an important message to many investors. "The fundamentals of Mexico haven't changed," said Reichmann International vice president, Daniel Haggarty, who is based in Mexico. "There have been some bumps and people have stubbed their toes; but when the US reached out its hand with the aid package, it showed that the relationship with Mexico is now different. The message from the US was as clear as a bell: Mexico is a long-term partner in the development of North America."

Considering the future

Two years after the devaluation, new building is still slow, but it is beginning to show signs of life. Although office and residential building is still in the doldrums, tourism and industrial construction is gaining strength. Still, there are key limitations to any sort of large-scale boom in the medium term. The most important factor holding back a full-scale recovery is the banking sector. With interest rates still high, Mexican banks have basically stopped granting new loans, so the only people building these days are those who can self-finance, which greatly limits the investment pool.

Incredible opportunities

For some foreign companies who know they will stay put in Mexico for the long-term, the crisis has given them incredible opportunities. Procter & Gamble, Volkswagen, and other international companies have all embarked on new projects. "It is a buyers market," says Sara Topelson, the President of the UIA, who is also an architect in Mexico. "For people who have money, there are some tremendous opportunities." There are some signs that the banking crisis is easing – interest rates have fallen as Government bailout packages and new foreign partners are helping banks improve their balance sheets. But it will still be some time before Mexican banks start loaning in large quantities again, so foreign investment and Government spending will be critical for the initial recovery of the sector. **WA**

Building in Mexico

GENERAL INFORMATION

The Land: Mexico is the largest and northernmost Latin American country with an area of 1,972,550 square kilometres. Mexico shares borders with the US to the north, the Pacific Ocean to the south and west, the Gulf of Mexico and Caribbean Sea to the east, and Guatemala and Belize to the south-east. There are coastal plains along the Pacific Ocean, Gulf of Mexico and Caribbean Sea.

Climate: The climate changes with altitude from tropical to desert. The lowlands and hills under 1,000 metres (the Tierra Caliente) have a mean annual temperature of 250°C. The tropical highlands at 1,000-2,000 metres have a temperate climate with a mean temperature of 190°C. In the Central Plateau and Chiapas Highlands the mean temperature is 170°C, while the highest peaks above 4,250 metres rarely exceed 100°C.

Population: 93.99 million (urban 73%, rural 27%).

Ethnic Composition: Mestizo (Indian-Spanish) 60%, Amerindian 30%, Caucasian 9%, other 1%.

Language: Spanish.

Religion: Roman Catholic 89%, Protestant 6%, other 5%.

Capital: Mexico City.

Time Difference: Mexico has three time zones from 6 to 8 hours behind GMT.

Currency: Mexican peso with 100 centavos.

TRAVEL & BUSINESS INFORMATION

Visa Requirements: Visits up to 90 days do not require a visa. A free tourist card is issued upon arrival with proof of citizenship. For business travel, a Business Visitor's Visa (FMN), which is similar to a tourist card, is free and is valid for up to 30 days.

Dialling Code: The international dialling-in code for Mexico is 52. To place an international call from Mexico the access code is 98, except to the US and Canada where it is 95.

ECONOMIC DATA

Consumer Price Index:		Exchange Rates:	
1990 = 100		Pesos per US $	
1991	122.7	1991	3.07
1992	141.7	1992	3.12
1993	155.5	1993	3.11
1994	166.3	1994	5.33
1995	182.0	1995	7.72
1996 (est)	220.0	1996	7.54

Miscellaneous: In December 1994, the peso was devalued from US$3.4 to US$7.5.

GENERAL CONSTRUCTION INFORMATION

Construction Outlook: The Mexican construction industry is sound and well organised. The industry employs approximately two million people. There are many industry related associations.

The highly competitive bidding climate of 1996 is expected to continue through 1997. The government projection for construction volume in 1997 is over 147 billion pesos. Activity will be primarily in the following sectors:

- Housing
- Communications
- Transportation (railroads, ports, highways)
- Utilities (gas, electricity)

Unemployment in the industry is a problem, but it is expected to improve gradually in 1997.

Inflation: The building industry inflation rate in 1996 was approximately 31%. The projected rate of inflation for 1997 is 19%.

Procurement of Construction: The typical method for construction procurement for large private sector projects is the traditional design-bid-build approach. The design-build method is unusual, but it is being used in some cases. In the traditional approach the owner hires the architect to prepare the design. Once preliminary design is done, the owner hires a project management (PM) company. The PM hires the engineers, organises the completion of the design, puts the project out for bid, does general coordination between all parties and oversees construction.

The PM selects five or six subcontractors for each trade and takes bids for the work. Construction documents are usually incomplete when a project is bid. Typically, they are less than 80 percent complete. The A/E continues to develop the design as construction progresses, working closely with the contractor.

There are standard forms of contract used in the construction industry. The most common form of which is the Unit Prices-Fixed Time contract in the private sector. Typically, the contract has a clause allowing costs to be adjusted if prices increase at a rate of five percent or more of the total cost of the work to be done at any specific time.

Nevertheless, increasingly there is a trend towards using fixed price contracts. The private sector is very aware of the advantages of bidding when the construction documents are completed.

Field supervision is commonly done by the same PM firm. If there is neither a PM nor someone in the owner's employ to supervise, then a firm is hired to perform field supervision.

Insurance: There are no specific legal requirements for liability insurance. On major projects, the owner usually has insurance to cover construction, damages that may be caused to third parties or their property, besides floods and other natural disasters. This insurance does not cover property or persons of the companies involved in the construction of the project. They must provide their own insurance.

The law makes every participant responsible for damages to the owner or to third parties for reasons of professional negligence. There is no professional liability insurance in Mexico.

Design Professions: There are some standard fee schedules used by designers. These schedules are published by the national design associations. They are usually based on a percentage of project cost, but in some cases recommend other criteria to use, such as number of drawings, time expended, etcetera. An average estimate for design fees would be three to four percent of construction cost for new construction projects.

Designers have the capacity and expertise for any type of construction project. Occasionally,

designers may be helped in industrial projects by foreign designers. All infrastructure projects are designed in Mexico.

Contractors: The general contractor is not a strong entity in major building projects. The subcontractors are hired through the PM, who acts as an "agency" for a fee. As a result, the PM does not usually carry any direct risks.

Frequently, the purchase of FF&E items is done by the PM on the owner's behalf, as well as the purchase of mechanical and electrical equipment. Occasionally, the PM will also purchase some construction materials directly.

All contractors are members of the Camara Nacional de la Industria del la Construccion, which has a complete register of companies divided by specialties. PMs, however, are members of the Camara Nacional de Empresas de Consultora, which also keeps a complete register of its members.

CONSTRUCTION MATERIALS AND METHODS

Material Availability: All building products are either produced or readily available within Mexico. Some building products are imported on a fashion basis. In these cases, the most frequent sources of imported construction products are the US, Spain, Italy and Germany.

Labour Availability: Generally, labour supply is good for all trades. All construction labour is unionised. There are countless union syndicates, grouped under two main central unions: Confederacion de Trabajadores de Mexico (CTM); Confederaciun Revolucionaria de Obreros y Campesinos (CROC).

There are minimum legal wages that actually serve only as a reference point, since all workers earn more than this.

It is usual for a contractor or subcontractor to hire a maestro. The maestro is a provider of labour to whom *destajos* are paid – unit prices for labour only. The contractor or subcontractor provides the materials and equipment and pays the social security and taxes. The maestro is not legally responsible for anything.

Equipment Availability: Every type of construction equipment can be purchased in Mexico. Most of them are fabricated or assembled in Mexico with license from the manufactures in the US, Japan and France. Equipment not made in Mexico is imported through established Mexican distributors. The top contractors own all the necessary equipment for the construction of any building project.

Favoured Construction Techniques: In Mexico, large buildings typically have concrete structural frame. Steel framed structures are seldom used. Interior partitions may be constructed from concrete block, clay tile or gypsum board and metal studs. Occasionally, plaster may be used. Exterior wall materials and mechanical and electrical equipment are similar to those used in the US.

Use of prefabricated components is common. Exterior aluminum panels and precast structural materials are examples of Mexico's use of this advanced technology. Major projects use high strength concrete (350 kg/square metre) which can be formed for more creative expression.

CONSTRUCTION COST GUIDES

Costos y Presupuestos published by Peimbert (Tel: +52 5 286 4343, Fax: +52 5 286 3380)
Costos de Construccion Pesada y Edificacion published by Compubras, S A.
Costos published by Bimsa-Southam (Tel: +52 5 357 12222).

Approximate Construction Costs: The following square metre unit rates are provided for rough comparison purposes. All cost are in New Pesos.

	Pesos/m^2
Office building, mid-rise	
Shell & core	2,050
Tenant fit-out	900
Hotel, mid-rise, three star	3,850
Apartment, average quality	3,085
Industrial building	1,900
Warehouse building	1,250

Regional Cost Variations:

City	Index
Acapulco	1.10
Cancun	1.19
Tijuana	1.22
Monterrey	1.05
Guadalajara	0.95
Mexico City	1.00

USEFUL ADDRESSES

Federacion de Arquitectos de la Republica Mexicana
Luis Gonzalez Obregon No. 15
Centro Historico
C.P. 08020, Mexico, D F
Tel: 510 86 99
Fax: 510 86 99

Federaciun del Colegio de Ingenieros Civiles de Mexico
Tacuba No. 5, Col. Centro
C.P. 08000, Mexico, D F
Tel: 512 06 51
Fax: 512 06 51

Colegio de Contadores
Bosque de Tabachines No. 44
Fracc. Bosques de las Lomas, C.P. 11700
C.P. 11700, Mexico, D F
Tel: 596 17 44
Fax: 251 13 35

Collegio de Ingenieros Civiles de Mexico (CICM)
Camino Sta. Teresa No. 187
Col. Parques del Pedregal
C.P. 14010 Mexico, D F
Tel: 606 23 23
Fax: 528 09 23

Camara Nacional De La Industria De La Construcciun (CNIC)
Periferìco Sur No. 4839, Col. Parques del Pedregal, C.P. 14010, Mexico, D F
Tel: 665 02 24
Fax: 665 21 27

Colegio De Arquitectos de Mexico (CAM)
Ave. Constituyentes No. 800
Col. Loma Alta, C.P. 11950 Mexico, D F
Tel: 570 51 83
Fax.: 259 54 23

Camara Nacional De Empresas De Consultoria
Torre World Trade Center Cd. Mexico
Ave. de las Naciones No. 1, Piso 18-35
Col. Napoles , C.P. 03810 Mexico, D F
Tel: 488 05 22
Fax: 488 05 27

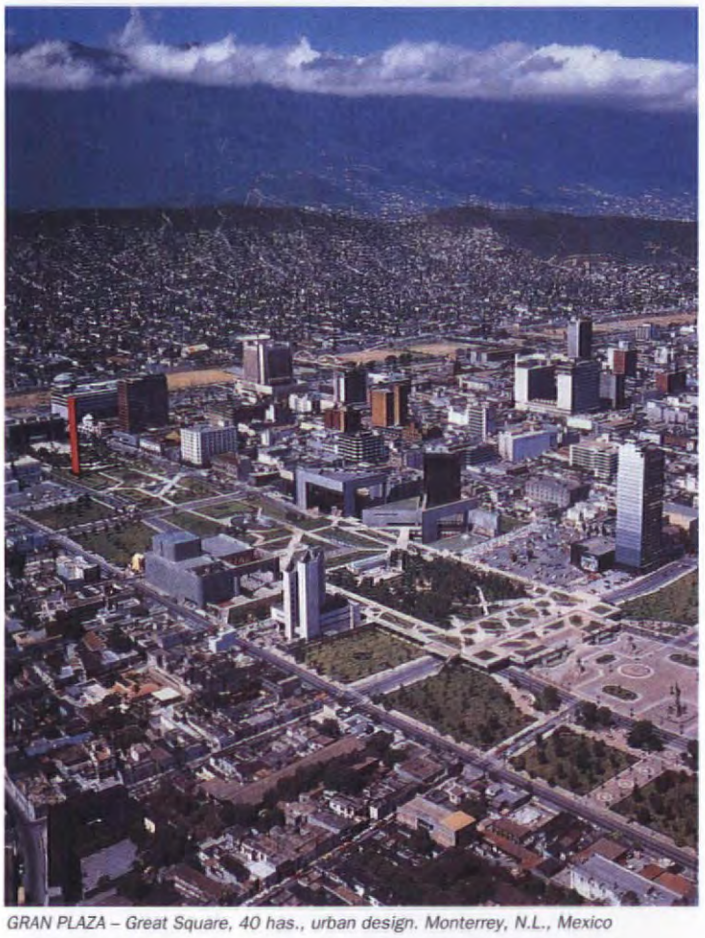
WA *and* Hanscomb *wish to thank Grupo Aconsa of Mexico for assisting in the presentation of the information in this country report.*

Mexico – 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
Aguilar, Javier Senosiain	2	5	1		•	•	•	•	•	•	•		•	•		
Alvarez, Augusto H. Arquitecto y Asociados S.C.	16	28	4		•	•	•	•	•	•	•	•	•	•	•	•
Arditti & Arditti Arquitectos	9	15	1			•	•	•		•	•	•				•
Arquitectura y Diseno 4	2	3	1													•
Broid, Isaac	6	8	1				•	•				•			•	•
Bulnes 103 Grupo de Diseño	32	44	3		•	•	•	•	•	•	•	•	•	•	•	•
Corporacion Geo	20	1500	12					•								
Cortina, Gutierrez Arquitectos S.C.	20	38	1			•	•	•		•		•				
de Leon, Arq. Teodoro Gonzalez	8	25	1													
de Salazar, Francisco Perez Arquitectos	4	10	1			•	•	•		•			•			
de Yturbe Arquitectos	5	15	1			•	•	•	•	•	•	•	•			
Eichelmann Arquitectos S.C.	4	6	1				•	•				•				
Ezquerra y Asociados S.C. Arquitectos	-	-	2			•	•	•	•	•		•				•
Fideicomiso del Centro Historico de la Ciudad de Mexico	5	30	1			•	•	•	•	•		•	•	•		•
Gas, Jose Luis Aguirre Arquitectos	4	7	1					•		•	•	•				•
Grinberg & Topelson Arquitectos	3	6	1		•			•					•			•
Grupo Baia	12	60	2	•		•	•	•	•	•	•	•	•		•	•
Grupo de Diseño Urbano	6	15	1				•	•			•		•			•
Guindi, Martin Arquitectos	3	10	1		•		•		•	•					•	
Gutierrez, Arq. Martin L. y Asociados	8	20	1	•	•		•	•	•				•			
Hernandez, Agustin Taller del Arquitecto	2	5	1	•		•	•	•			•	•	•	•	•	•
Idea Asociados de Mexico S.A. de C.V.	12	19	1				•			•		•				
Ideurban S.C.	15	120	1		•	•	•	•	•	•	•	•	•			•
Infante, Juan Jose Diaz	1	2	1			•	•	•		•	•	•	•		•	
Infonavit	63	3500	-													•
Legorreta Arquitectos	21	31	2			•	•	•	•	•	•	•	•	•		
Madaleno, Sordo Arquitectos	30	60	1			•	•	•		•		•				•
Matthai, Arquitectos / Matthai S.A.	7	12	1			•		•	•	•		•				•
Mijares, Carlos Arquitecto	1	1	1		•		•	•						•		•
Murguia Arquitectura	7	12	1		•	•	•	•	•	•	•	•	•		•	•
Picciotto Arquitectos	10	20	1		•	•	•	•		•	•					
Quijano, Augusto Arquitectos, S.C.P.	4	14	1			•	•	•		•		•	•		•	
Riojas y Rullan Arquitectos, S.C.	2	11	1			•	•	•		•	•	•	•		•	
Serrano, Francisco J. Arq.	6	17	1		•		•	•		•	•	•	•			
Ten Arquitectos	6	18	1		•	•	•	•	•	•	•	•	•	•	•	
Vázquez, Ramírez y Asociados, S.A. de C.V.	30	140	3	•			•	•			•	•	•			•
Villaseñor, Diego Arquitectos y Asociados	21	26	1					•	•	•						•
Villegas + Asociados	4	5	1		•	•	•	•	•	•	•	•	•		•	
Zabludovsky, Abraham Arquitecto	8	16	1			•	•	•			•	•	•			
Zohn, Alejandro y Asociados	5	15	1			•	•	•	•	•	•		•			

CETEC – Centro de Tecnología Avanzada para la Producción, ITESM. (Instituto Tecnológico y de Estudios Superiores de Monterrey). Advanced Technology Center for Production, ITESM, (Technological Institute and Superior Studies of Monterrey). Monterrey, N.L., Mexico



GRAN PLAZA – Great Square, 40 has., urban design. Monterrey, N.L., Mexico

MUSEO DE HISTORIA MEXICANA – Mexican History Museum. Monterrey, N.L., Mexico

BULNES 103 GRUPO DE DISEÑO

Head Office

Bulnes 103 Grupo de Diseño/Monterrey
OB Formación Arquitectónica, S.C.
Castillo de Chambord 103, Col. Valle de San Angel
Garza Garcia, N.L. 66290, México
Tel: +52 8 335 3990. Fax: +52 8 378 6462

Associates

México, D.F./Augusto H. Alvarez Architectos y Asociados, S.C.
Dallas, Tx/Corgan Associates Architects

Key Personnel

Partners: Arq. Oscar Bulnes Valero, AIA, AE-SAM, FCARM, CANL; Arq. Bernardo Lira Gómez, SAM; Arq. Garbriela Cabezut Reta, CANL; Arq. Ma. de la Luz de León Córdova; Arq. Oscar Bulnes Gonzàlez; Arq. Patricia Cantú Hinojosa; Arq. Trinidad Martinez Guerrero.

Recent Clients

Industrias Monterrey, IMSA y PRIMSA; Gobierno del Estado de Nuevo León; Parque Fundidora; Delegación Gustavo A. Madero, D.D.F.; Consejo para la Cultura de N.L.; Consjeo Nacional para la Cultura y las Artes, CONACULTA; Museo de Historia Mexicana; Museo de Monterrey; Cervecercia Cuauhtemoc Moctezuma; Sistema de Transporte Colectivo, METRORREY; Parroquia Jesús el Buen Pastor; Instituto Tecnológico y de Estudio Superiores de Monterrey, ITESM; Bancomer; Banamex; Bancomext; INDEVAL; Nacional Financiera, NAFINSA; Bolsa Mexicana de Valores; INFONAVIT; Inmobiliaria Valle Oriente; Hilton; Marriott; Corporativos: ALFA, VITRO y CYDSA.

Company Profile

The firm has a reputation for creative architectural design thanks to the commintment of the company's principal, Oscar Bulnes, who is dedicated to finding an original solution for each project. The provision of symbolism, responsiveness to the individual characteristics of each building programme – according to history, function, site and context, both present and future.

Bulnes 103 maintains an organisational structure designed to promote a close working relationship between partner and client. Practices interchange staff, and assign task-force teams to each project, creating a "small office within a large office" model, that facilitates continuity and client responsiveness. The practice also provides other services, including interior design and engineering. The use of computer systems, such as CAD, ensures effective resourcing for the development of the projects. Twenty-eight years of experience has made it possible for the firm to offer a broad range of skills – the design of corporate offices, shipping centres, hotels, industrial, educational and religious facilities, laboratories, museums – having carried out large scale planning and urban design projects, and having also maintained an active involvement in housing design. The firm has handled a wide range of major projects for clients who include commercial, private institutions, as well as local and federal government agencies.

Oscar Bulnes is responsible for some of the most significant projects in Monterrey, including: Gran Plaza (Great Square, 1982); Teatro de la Ciudad (theatre, 1982); H. Congreso del Estado (State Congress), governmental office building, (1983); INFONAVIT building (National Housing Institute, office building, 1983); Centro de Tecnologia Avanzada para la Proudcción, ITESM (Advanced Technology Center for Production, educational and research building, 1987); Torre de Chambord, (Chambord Tower, apartment building, 1990); Centro Comercial San Agustin (shopping centre, 1992); Sucusal Bancaria Bancomer (bank branch, 1993); Estación Zaragoza, Sistema de Transporte Colectivo Metro (metro station, 1994).

Oscar Bulnes has received many professional and civic awards for design, and in addition to work throughout Monterrey and Mexico City, has formed working relationships with leading architects in Mexico City and the US. He's also an Emeritus Academic Architect (EA) and president of the Monterrey Chapter for the Academia Nacional de Arquitectura de la Sociedad de Arquitectos Mexicanos (SAM).

Mexican waves

Katherine MacInnes talks to Roger Soto, who set up the Mexican office of the US giant Hellmuth, Obata and Kassabaum, and his partner, Ricardo Mascia – two architects who have capitalised on the economic climate since devaluation. While most of HOK's clients are fellow North Americans, Soto and Mascia also have Mexicans on their books who are anxious to gain prestige through working with an international firm.

"If you are looking at practising in Mexico there are a variety of approaches open to you" explains Roger Soto, an appropriately named softly spoken Chilean, educated in North America, who founded HOK Mexico. "Do you form a joint venture with a Mexican or do you go it alone? We concluded that for HOK to have a long term presence in Mexico it would be beneficial to have a Mexican partner who brought all the contacts and knowledge of the Mexican market and inspired confidence, particularly amongst Mexican clients, that we were here to stay."

"So that you hit the ground running basically" adds his more forthright partner, Ricardo Mascia, also educated in, guess where, North America, " ...joining up with someone who can provide what you are lacking as a foreigner".

However, difficulties arose from "marrying the two cultures" – the commercial, proactive approach of North America and the more passive old-school Mexican way – "so we are now working pretty much on our own".

Mascia claims that "there is a certain credibility in hiring HOK because of control of cost and control of the schedule". He adds that for Mexican clients "there is the added prestige of having this international design company do your work here" but mainly HOK's clients "are American, or I should say, North American and some progressive 100 percent Mexican clients".

"I don't know if we should say progressive" Soto suggests quietly. "I would just say that some Mexican clients have found it useful to hire us. But I agree that the sustaining element of the office is the continuous inflow of projects from corporate clients in the US – we probably wouldn't have a practice in Mexico if we didn't have that."

A lot of new clients have come over with North American Free Trade Agreement (NAFTA). Some international companies such as Proctor & Gamble, however, have been here for a long time. "Their Mexico office is run by Mexicans – they have their own providers and suppliers" Soto explains. "P&G hired us because of a contact elsewhere – even though they are an American company they are not necessarily inclined to use an American architect."

HOK are working with Ingineros Civilis Associados (ICA), one of the oldest and largest construction companies in Mexico, on an urban design under construction for a Mexican client, Centro Sur in a 180 hectare section of the city to the south of Queretaro, two hours north of Mexico City. It has been going a little slowly because of the recession, but they are expecting to start selling land shortly to start generating the income that they need to continue. Most of the buyers are Mexican companies. "This is one of those projects where it is 100 percent Mexican client and Mexican developers – no North Americans involved. "It is interesting" says Soto "because it is one of the few jobs I have seen in Mexico where the state government and the local government have collaborated and identified a growth policy for the city. An example of what will happen is the growth of second cities and third tier cities with the decentralisation of growth, and the local government becoming champions of development."

"And the fact that they do a plan" adds Mascia. "Ahead of the growth anyway" agrees Soto. "That is kind of new."

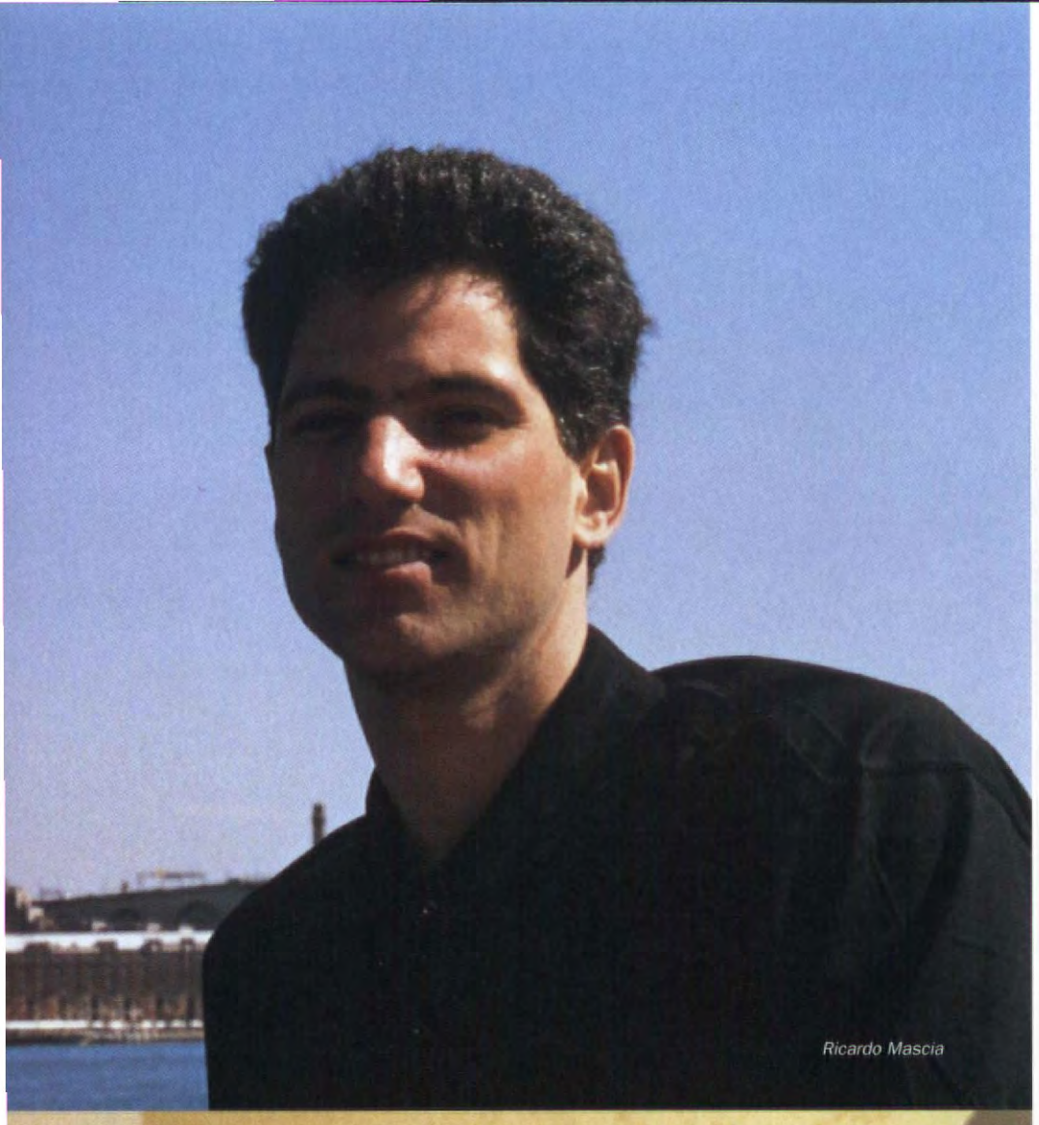
So why did they choose HOK? "Well, they felt that they needed the expertise that we could bring" explains Soto. "We had done some early projects on urban design where we had produced a conceptual masterplan with our St Louis, Illinois HOK office and ICA had been really impressed with what we had done."

"I think that speaks to another advantage that some of our clients see in hiring HOK" Mascia adds. "They know that we are a conduit to a lot more experience: there is great planning experience in St Louis for example and great retail experience in Dallas ...basically, if a client comes to us they can get literally anything designed." An ambitious claim, but is there enough work to put theory into practise? What, infact makes HOK keep a base in Mexico?

"The thing that is curious about us after devaluation, is that we actually grew" says Soto. "A series of commissions from Avantel, the Mexican telephone company, came at exactly the time when everybody else was virtually out of work so we hired people and grew. For instance in December 1994, within three months of devaluation, most of the international competition was gone. But we didn't start feeling the recession for probably 18 months."

"Also, if we weren't here working with our

"We are providing services for the Hong Kong office who are working on a project in India. Talk about 'global practice'"



Ricardo Mascia

Roger Soto

clients on day-to-day problems, we would only have a very limited number of projects," Soto explains.

"Yes", agrees Mascia, "there is a tendency to work with the firm down the street. This has been a comment from our clients: they would like to work with XYZ in New York but boy is it tough if they don't have an office in Mexico."

Mexican firms appreciated that HOK stayed after devaluation and suffered along with the locals rather than striking camp like some of the international firms. "It is kind of a bonding thing" Mascia continues, "every day they consider us to be more Mexican, which is exactly what we want. We want to be lumped in with the local architects not the international ones. It is kind of a goal. So having weathered the storm, we have proved our commitment."

"There is another aspect to it" says Soto "which also applies to KMD [Kaplin McGoldlughan and Diaz a San Francisco-based office of four or five years] our only other competitor here. Global practice in architecture is, for the majority, essentially exporting services from the home country. Right? I mean, that is essentially what they are doing. What we are doing is different. When we set up an office in a country we are not so much exporting services but during this crisis what is beginning to happen to us is that we are exporting expertise from Mexico to outside. So we have become a Mexican services exporter. For example, we are providing services for the Hong Kong office who are working on a project in India. Talk about 'global practice'. We expect soon that we will be providing services to assist services in the States because our cost structure is lower we can help them when we are under crunches to do jobs, so rather than staffing up fully there we can help them in these periods of excess."

"Mexico has reached the bottom of the recession, but we won't be fully out for another two years" Soto confirmed. "It will change of course, as the economic situation improves, but right now the strongest area for foreign development is probably resorts. Having said that there are a lot of able Mexican firms working in this area, because it is a field working in dollars. But when the economy starts turning around, you will begin to see the same projects that attracted foreign architects and foreign developers to Mexico in the eighties: large mixed use projects, commercial, retail put together in large complexes. Being an optimist, I am hoping that we are going to start seeing stuff coming onto the boards in about a year." **WA**


H

Symbol of Utopia

In 1990 Teodoro González de León, J Franciso Serrano and Carlos Tejeda submitted an ambitious entry for a high profile competition run by DINE, calling for Latin America's most extensive real-estate project, an office complex with plans for more than 500,000 square metres of construction. To their delight, the trio won. Other entries were both modest and financially viable but the González de León, Serrano and Tejeda scheme, which involved re-landscaping the existing urban fabric, fulfilled the client's brief – a ground-breaking project of monumental proportions. Miguel Adria, editor of *Arquitectura*, provides a critical appraisal of this giant scheme. Katherine MacInnes visits the site and talks to the architects, general manager and the chief engineer.

Pedro Hiriart

Pedro Hiriart

Opposite *Marco 1 has open plan square floor plans of 850 square metres. Service cores are located outside the plan. Two entrance halls connect the tower to a pedestrian street and shopping area.* ***Top*** *The talud glass roof covering the entrance from the carpark.* ***Bottom*** *The Edificio Oriente (Eastern building) was the first phase to be completed. It consists of six levels and comprises 1,500 square metres of office space in free 30-metre-wide floor plans*

▲ Michael Calderwood

Appraisal

The Arcos Bosques scheme is a symbol of what Mexico was expected to have become by the early 1990s; a new land of opportunities for foreign investors – a "symbol of Utopia". The project was made possible by a combination of two factors: the urban devastation caused by the 1985 earthquake, and the illusory economic programme started by President Carlos Salinas de Gortair in 1988. It was the apparent economic boom that paved the way for a new wave of investors, both Mexican and foreign, who set their sights on developing facilities to international standards. Arcos Bosques reflects the needs and aspirations of the fast growing multinational corporate sector.

The completion of Marco 1, the first of two "arches", in autumn 1996, signalled the half way point for Arcos Bosques. This high-rise block has large open plan offices (standard in Western design but unusual in Mexico) tailored to attract multinational corporations looking to set up a Mexican office. The arch has 30 square metre floors in each of the supporting columns with four 30 by 90 metre upper floors where they join, creating the arch. The floors are completely open-plan, with service and circulation cores placed outside the main building to maximise the potential rental space.

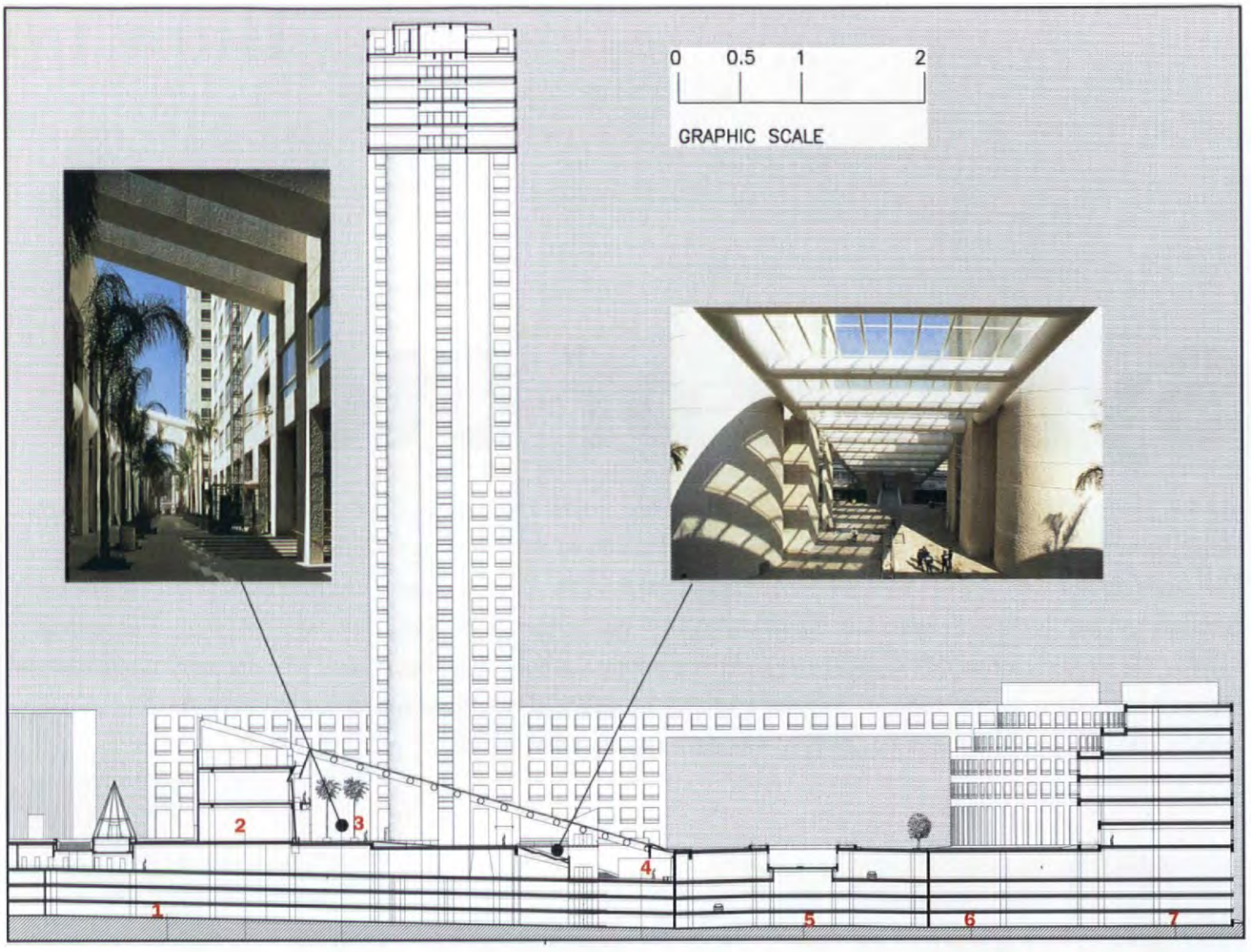
The proportions and scale of Arcos Bosques evolved from designs for joint projects previously undertaken between González de León and Serrano, including the Palacio de Justica, with its immense frontispiece of "frames within frames", and the monumental corporate headquarters for Hewlett-Packard in the Santa Fe area. The latter is adjacent to one of Serrano's solo projects, the brick-clad Universidad Ibero Americana campus, in which horizontal volumes are juxtaposed with pure geometrical voids. The scale of the project is also reminiscent of the grand plans developed by Le Corbusier, for whom González de León worked for two years from 1948.

The site is beside a highway connecting two of the most exclusive residential and corporate areas on the outskirts of Mexico City, Santa Fe and Bosques de las Lomas. The overall plan involves the integration of the scheme with its context. The vertical columns either side of the arch are visually anchored by *taluds* – inclined planes typical of pre-colombian temples. A pedestrian street is planned along the axis between the two arches providing access to the shopping and sports facilities.

The central concept of Arcos Bosques is to present a complete masterplan, including road restructuring, and the creation of a self-contained urban development. This isolated area – once a mine and subsequently a landfill site – has been given a new lease of life and a fresh identity.

The architects

Francisco Serrano, Teodoro González de León and Carlos Tejeda, along with contributions



Key

1 Private parking
2 Commercial area
3 Pedestrian street
4 Motor lobby
5 Public parking
6 Private parking
7 North building

Above background *Section through the complex.* ***Left inset*** *The entrance to Marco 1 showing the water sculpture with a booming cascade of water flowing into calmed almost horizontal canals alongside the main entrance.* ***Right inset*** *The promenade between the two towers is surfaced in unpolished St Thomas stone and is punctuated at regular intervals by palm trees. Benches and other seating areas have also been designed by the architects. Above photographs by Pedro Hiriart*

from José Arce and José Ma Larios, collaborated on the design of Arcos Bosques. The architects were required to pool their cumulative experience in public sector architecture in order to build a private initiative scheme. This entailed the incorporation of new solutions for a corporate building. Two of the areas in which this is clearly evident are the public spaces and transit areas – waiting rooms, plazas, streets, motor lobbies and elevators – which, according to Miguel Adria, "monumentalise the traditionally anodyne architectural genre of corporate headquarters".

What defines the building above all else is that it is custom made for prospective international tenants who require "Western" office standards. According to Serrano, one of the most difficult parts of the brief was to ensure that the project would look complete at the end of every stage of development, in case the project had to be terminated due to lack of funds, before it reached completion. This phenomenon has become one of the defining characteristics of Mexican architecture: many large projects are a composition of a series of autonomous parts.

Unlike in many European and North American projects, the same architects have designed everything from the landscaping to the signage – even the cabins in the Finnish-made lifts were designed by them. González de León is a firm believer that time spent waiting is time wasted – so he designed mosaic murals with geometric patterns based on the building itself, to be positioned outside the lifts. The relatively cheap labour in Mexico meant that detailed finishes have been achieved using manual labour which would be prohibitive, due to cost, elsewhere. The entire white concrete surface of the building, for example, is hand chiselled.

The "urban street" which runs parallel to the roads outside the building will eventually form a promenade which extends between the towers. González de León plans to place sculptures in the niches along the promenade. To enhance this luxury of including art in architecture, floor to ceiling murals of gold leaf mosaic of the Byzantine tradition lend a suitably glamorous feel to the entrance halls.

The client

The client is the land construction property company DINE, one of five principal subsidiaries of Sociedad de Fomento Industrial (DESC), a privately owned holding company. DINE have a considerable amount of experience in dealing

Right *Interior showing the gold floor-to-ceiling murals.*
Far right *Interior circulation space using wood and hand chiselled concrete aggregate also used in the facade*

with commercial developments in Mexico. González de León, Serrano and Tejeda developed a good relationship with the client and reluctantly (due to the current threatening climate) divulged some revealing anecdotes regarding the personality of the client: DINE bought special clay tiles for the roofs of the adjacent Pallo Alta housing scheme in order that the Arcos Bosques tower would benefit from an improved view, and also due to a display of social conscience that might benefit their reputation. Also, the client has reserved the penthouse suite for which he has specified a retractable glass roof over a pebbled patio to allow him to see the stars.

Of the four building stages, two are complete – the eastern building, the first stage, and Marco 1. The former is now fully leased. Although fewer multinationals are coming to Mexico than were predicted, the client's company have rented a substantial percentage of the main tower and more tenants are expected.

The chief engineer

Hernán Cortés' decision to build Mexico City on the same site as the "Mexica" people's city of Tenochtitlán, which is surrounded by lakes, means that the city is not only prone to earthquakes but it is also subject to flooding.

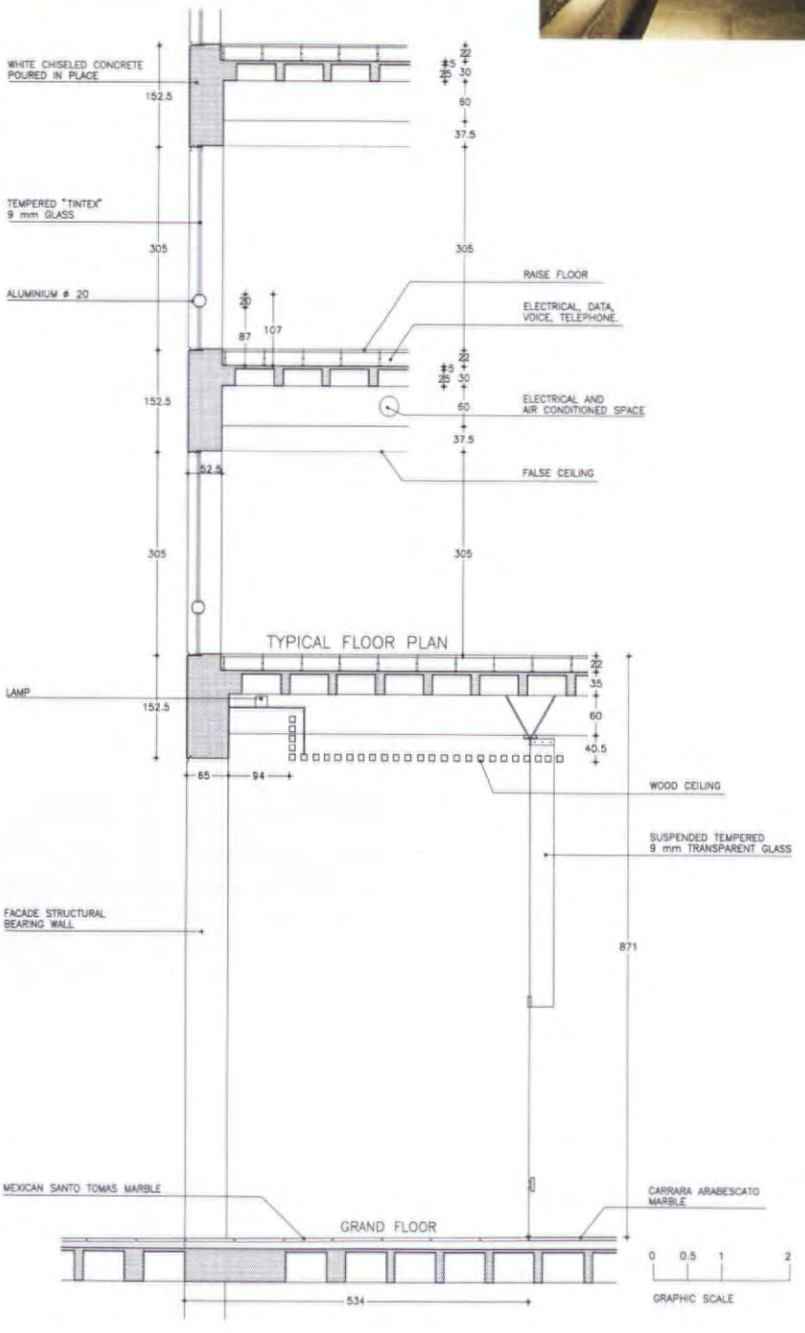
Fierro Manly, chief engineer on the Arcos Bosques, has supervised many of Mexico City's high rise projects – such as the Pemex centre which uses a steel frame support to resist seismic waves, and the World Trade Centre which is specially constructed of reinforced concrete. The Arcos Bosques site is on firm rock on a raised area of land to the west of the city.

The Marco 1 tower rises 35 metres above ground level and has foundations sunk to four metres. The foundations are unusually shallow because the base rock is near the surface; the retaining wall at the back of the site has been constructed to keep the sedimentary rock from shifting. The rock under the building does not need securing due to the compression from the weight of the buiding's construction.

The concept behind Arcos Bosques' earthquake proof design is threefold. Firstly, the site consists of a solid base rock which prevents the wave of the earthquake from amplifying as it would do in the waterlogged lowlands of the city centre. Secondly, individual elements of the design that may be vulnerable to earthquakes are isolated from the main structure: the glass roof over the foyer has been earthquake-proofed

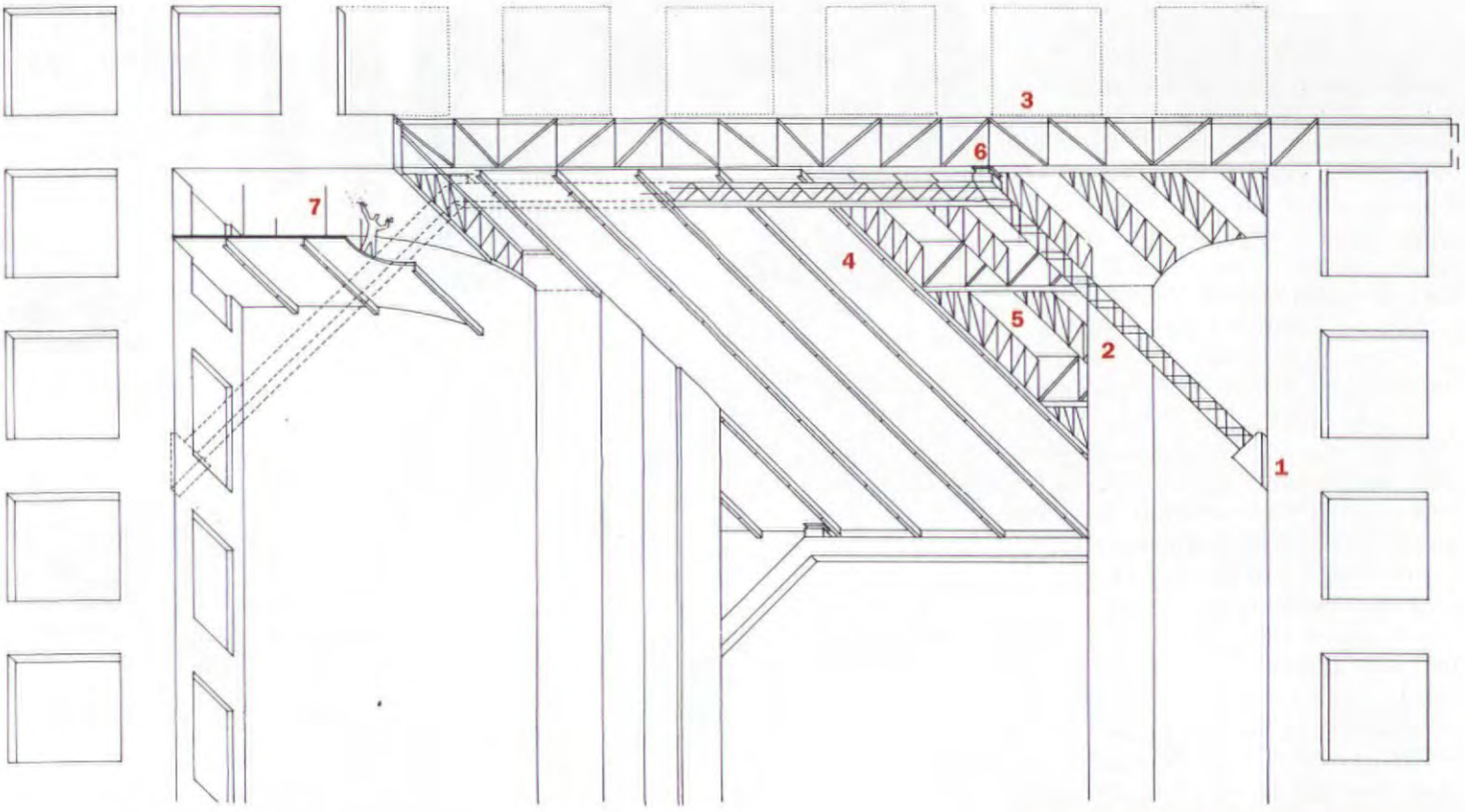
Pedro Hiriart

Jaime Navarro



Key

1 The provisional support holder
2 The scaffold support
3 Principal steel structure of the facades
4 The workmen's lift hung from the scaffolding
5 The steel framework of the bridge
6 Scaffold support substituted by concrete slab
7 Lift positioned to allow work under bridge



since each of the panes moves separately over the hollow metal trusses. Finally, the four main axes of the building form a cube which forces the slabs to move simultaneously when the "wave" of the earthquake hits the base.

The road that runs through the project is supported on pillars. These are based on pumice sand which escapes under pressure. Consequently the pillars had to be sunk 20 metres into the hard ground. The horizontal trusses between each elevated road section serve both to minimise horizontal movement generated by traffic and earthquakes, and to introduce a green element to the landscaping of the site.

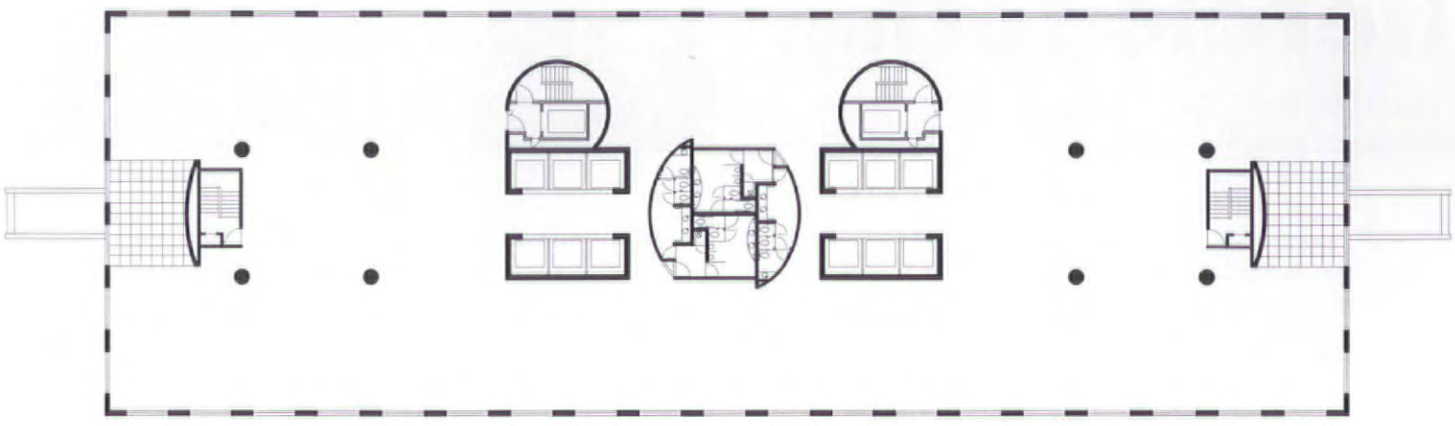
The general manager

Ignacio Ruiz Barra had recently retired as general manager of ICA when he was asked to come out of retirement to run this project in November 1993. He is in charge of the 3,000 builders employed at Arcos Bosques – all of whom are Mexican – with specialist stone cutters from Chimalhucan. Contrary to the international trend towards general contractors, Barra manages specific contractors himself.

It is unusual for the owners to give the manager dealing with financial affairs *carte blanche* in Mexico, but Barra had worked with the client before. Barra effectively insured himself against a disaster, such as devaluation, by applying an *a priori* strategy of making a down payment at the beginning of the project so that the price for the materials was fixed, but the cost of labour was on a sliding scale. Another factor which contributed to the extraordinary survival of this project were joint venture schemes between the contractors and suppliers. Together with the urban planning consultants Barra ensured that in the long term the leases could cover the cost of the building within a realistic time frame that should bridge fluctations in the economy. **WA**

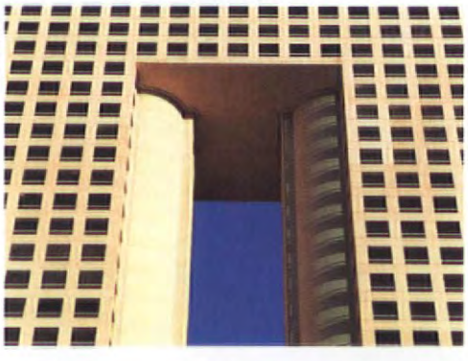
Top *Diagram detailing the construction of the bridge.*
Above *The bridge under construction*

Project:	Arcos Bosques	**Cost consultants:**	Ruíz Caraza S A
Client:	DINE	**Structural design:**	Diseño y Supervisión, SC
Architect:	Teodoro González de León, J. Francisco Serrano and Carlos Tejeda	**Mural designs:**	Teodoro Gonzalez de León
		Air-condition design:	GARVEL SA de CV
		Electrical design:	Tecnoproyectos SC
General manager:	Ignacio Ruiz Barra	**Hydraulics and**	
Engineer:	Alejandro Fierro Manly	**sanitary design:**	Garza Maldonado y Asociados, SC



Above *Plan of the floors above the bridge.* ***Below*** *Close up of the bridge between the two towers.* ***Bottom*** *Murals beside the lifts based on shortened perspective of the arch by Teodoro González de León*

Michael Calderwood



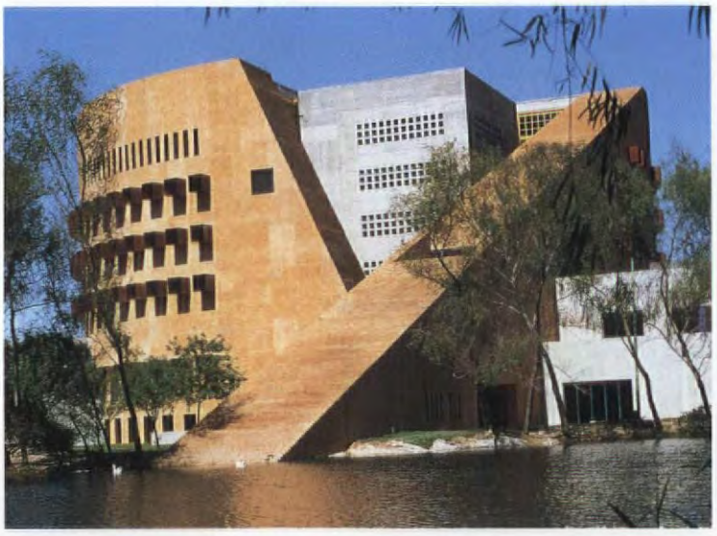
Pedro Hiriart

Arcos Bosques

Cost breakdown for Marco 1 in thousands of dollars

	Marco 1 (phase 2)		Parking under platform	
	cost in US$	% of total cost	cost in US$	% of total cost
Substructure				
Pre excavation:	4,071.76	5.94	841.85	4.97
Cement:	2,440.72	3.56	2,376.00	14.03
Substructure:	11,408.30	16.63	7,419.95	43.82
Superstructure & finishing				
Superstructure:	11,895.37	17.34		
Masonry	2,276.09	3.32	375.79	2.22
Finishing	3,124.71	4.55	144.19	0.85
Iron work	1,703.89	2.48	227.05	1.34
Carpentry	200.76	0.29	0.00	0.00
Windows	1,716.88	2.50	0.00	0.00
Waterproofing	346.03	0.50	387.91	2.29
Exterior work	745.84	1.09	1,732.65	10.23
Subtotal work	**39,930.37**	**58.20**	**13,505.40**	**79.76**
Services				
Elevators	7,636.51	11.13		
Electrics	2,853.52	4.16	512.51	3.03
Special installations	2,970.51	4.33	102.00	0.60
Sanitary installations	1,917.92	2.80	323.68	1.91
Air conditioning	2,614.84	3.81	0.00	0.00
Sub total installations	**17,993.31**	**26.23**	**938.18**	**5.54**
Total construction	57,923.68	84.43	14,443.58	85.30
Projects	2,289.58	3.34	939.54	5.55
Professional fees				
Licenses	2,969.28	4.33	440.26	2.60
Legal costs	225.95	0.33		
Supervison (RUCA)	1,641.22	2.39	578.82	3.42
Direction (DINE)	3,119.01	4.55	423.32	2.50
Other costs	435.53	0.63	107.94	0.64
Subtotal	8,390.98	12.23	1,550.33	9.16
TOTAL COST	**68,604.25**	**100**	**16,933.45**	**100**
Cost in dollars/ metres square	Marco 1 US$505.94		car park US$239.61	

Projects in Mexico



Heroic forms

Project: Monterrey Central Library
Architect: Legorreta Arquitectos

"We build for pleasure, they build for need" says Ricardo Legorreta, Mexico's most prolific architect referring to his work in the US. "They have to, we love to". This is an extraordinary post-devaluation observation – important because it provides an understanding of the demand for Legorreta's work both in Mexico and, more importantly, abroad which has cushioned his practice from the extreme effects of the recession.

His latest project in the Ninos Heroes park in Monterrey, Mexico's financial capital, contains both the central library and a conference and exhibition centre. The design is composed of two basic geometric elements: a cube embedded in a cylinder. A specially manufactured brick provides colour and texture to the cylinder, distinguishing it further from the exposed concrete of the cube and the base. The two extreme ends are each defined by upside-down triangles. One of the triangles descends into a lake, integrating the building with the lake and creating a sculptural object.

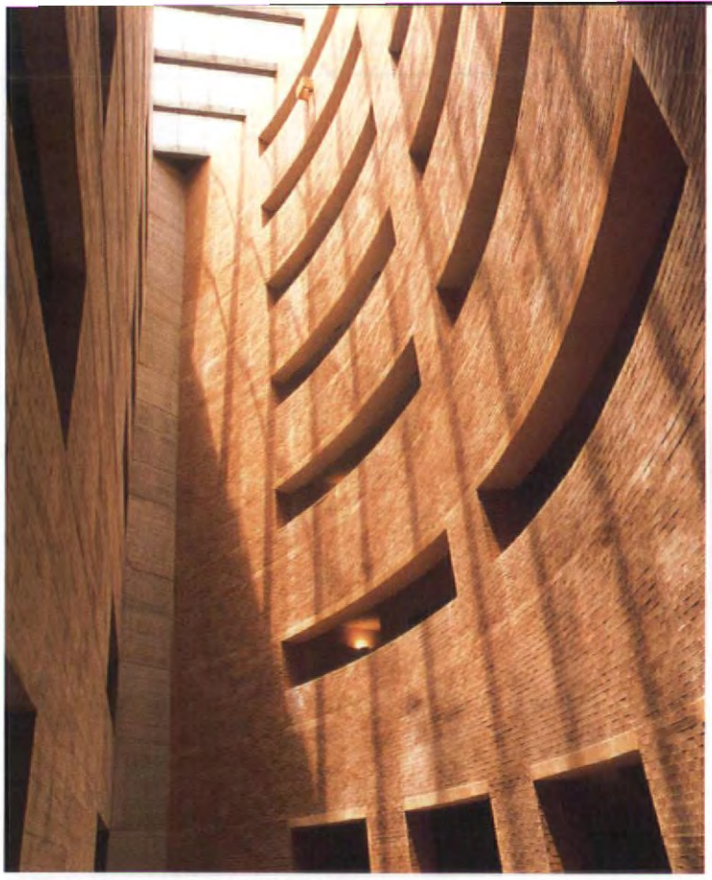
The cylinder and the cube contain the basic functions of the library; the reading areas located inside the cylinder have views to the park; the cube houses the books and is divided into quarters in a spiral form. This divides the floor plan into platforms, each with a three foot differential in level. The visual and physical result is a fluid space which provides flexibility in arranging book shelves and stacks. The two storey base which offers a more human scale to the library, contains the administrative areas, the auditorium, and the Library of Politics. A portico extends through the exhibition galleries in the base and connects the library to University Avenue.

Legorreta's work is characterised by a language first developed by Luis Barrigan whose work he admires for its "unbelievable sense of aesthetics and beauty" through the use of a distilled geometry derived from the colonial hacienda, a Moorish sensitivity to the use of water in architecture and bright saturated colours. However, although Legorreta is often described in the context of this master, with the Library, he takes the aesthetics further with an almost brutal use of geometry; a total juxtaposition of the building's mass with the lake and a practical, subtle use of natural colours.

The subdued colours reflect the use of robust materials chosen to endure high levels of air pollution in this industrial zone – exposed concrete for the central cube and the base, for the interior partitions in the cylinder containing the reading rooms and for the access portico – and to reduce maintenance costs for the client. Legorreta's use of the overhead sun: light and shade, particularly through the use of surface textures and the steel window shades, create a dynamic facade which is all his own. His aim is to create spaces where people "feel happy"; the reading rooms have views of the park, and the four courtyards allow natural light to penetrate the interior, further integrating the building with its natural context. KM **WA**

Top *The Moorish use of water in architecture influenced the design of the haciendas of the conquistadors. This was distilled and abstracted by Luis Barrigan. Legorreta has taken this relationship one stage further by juxtaposing the building's entire mass with the lake.* ***Left*** *Legorreta's use of the bright Mexican sun to create shadow patterns enlivening the building's surface lends an unusual dynamic to the monumental volumes of this municipal building. Photographer: Lourdes Legorreta*

Client:	Universidad Autonoma de Nuevo Leon
Project architects:	Ricardo Legorreta, Victor Legorreta, Noé Castro
Structural engineer:	DYS SC Ing Alejandro Fierro, Ing Roberto Morales
Service engineer:	Tecnoproyectos, ing. Federico Bernal
Cost consultant:	CB Consultores Ascoiados Ing Guillermo Canales
Contractor:	Boss Diseño y Construcciones

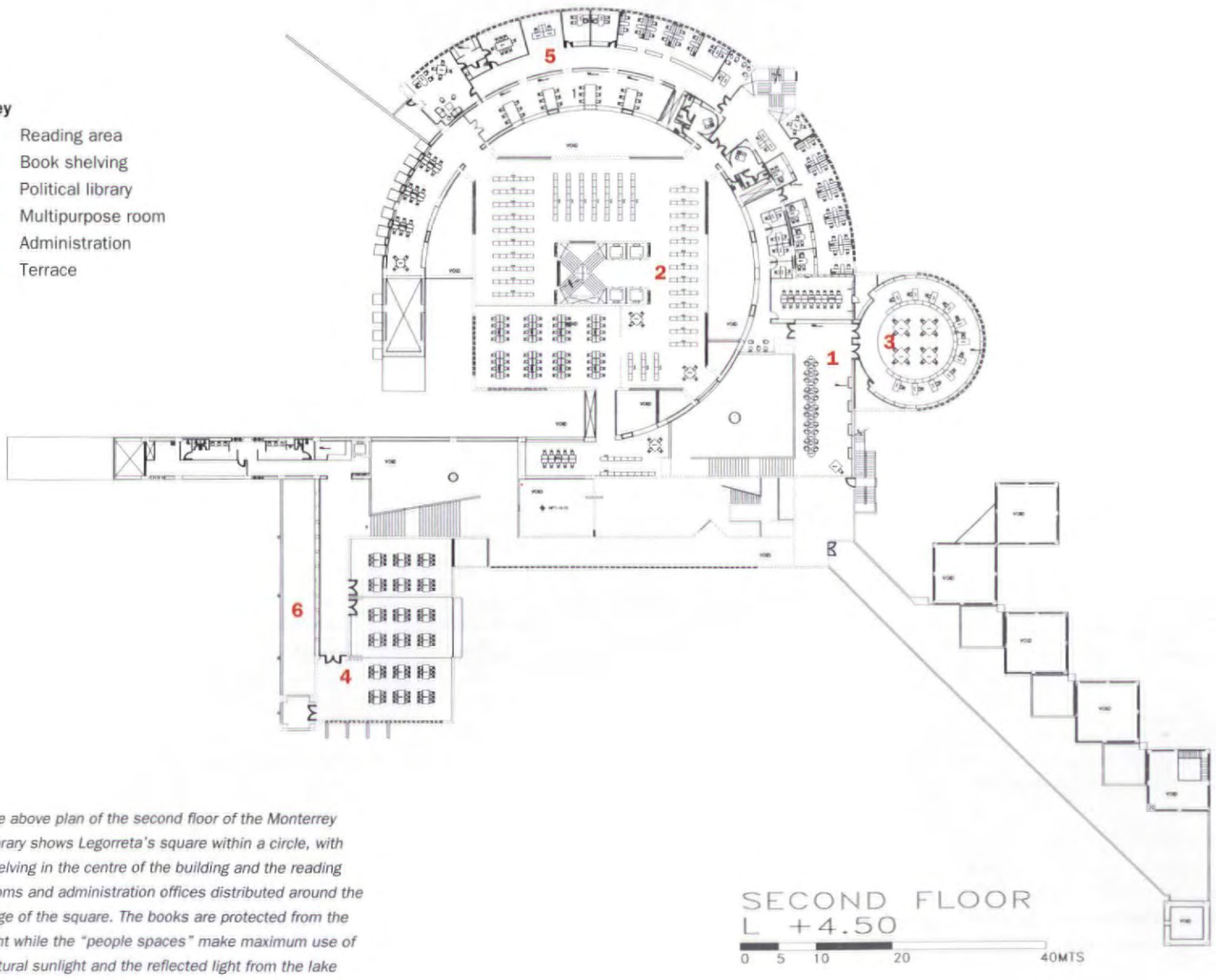


The gap created between the circle and the square creates a space through which light can enter the building

The library contains a variety of reading spaces with diverse qualities of light and different coloured walls

Key

1 Reading area
2 Book shelving
3 Political library
4 Multipurpose room
5 Administration
6 Terrace



The above plan of the second floor of the Monterrey Library shows Legorreta's square within a circle, with shelving in the centre of the building and the reading rooms and administration offices distributed around the edge of the square. The books are protected from the light while the "people spaces" make maximum use of natural sunlight and the reflected light from the lake

Media friendly

Project: Televisa mixed use building
Architect: TEN Arquitectos

Enrique Norten, who lends his name to TEN Arquitectos, describes his most recent building as a "silvery elliptical shell which responds to the explosive nature of this dense city zone". It is a "service extension" to the offices of Televisa – Mexico's main television network. Televisa is indeed a client appropriate to a firm of architects who are variously considered to be representitive of the cutting edge of Mexican modernism and, less flatteringly, "Mex-tec".

It is interesting to consider it alongside the work of Richard Rogers' headquarters for the British television network Channel Four, in London. Despite their different briefs – the Televisa building is a "shed" accommodating a parking garage, employee cafeteria and conference rooms while the Channel Four building is a headquarters office/studio block – the British-derived hi-tech influence is undeniable: computer generated curves, glass walls activated by the movement of people inside, to name just two.

The Televisa building is unusual in the context of the monumental tradition usually reserved for high-profile projects in Mexico City. It was conceived as an urban landmark and a corporate icon, an expression of "a world made of substanceless waves that travel through space without any apparent visible form". The computer generated "wave" of the Televisa roof was realised by structural engineers Ove Arup to fit a trapezoidal urban site. The resulting truncated aluminium cone contains the 600-seat restaurant. The shell curves in on itself exposing a hard outer facade to the main vehicular artery while at the end of the cone, the "eye" – a recessed glass curtain wall – affords a sense of naked transparency. The tapering end of the cone allows for the insertion of a two-storey volume that maintains the food preparation facility.

Client:	Televisa SA de CV
Structural engineers:	Guy Nordenson, Ove Arup & Ptnrs, NY Colinas de Buen, SA, Mexico
Site engineer:	Ing. Carlos César
Contractor:	PYC SA Ing Leopoldo Lieberman
Hydraulics and electrics:	Tecnoproyectos, SA
Air-conditioning scheme:	CYV. SA

The cone is supported by a wide black stone-clad base that is carefully scaled to the urban surroundings. The transition area between the two constructions is a mezzanine level used for banking, medical and union purposes. The horizontal emphasis of this layering defers to the soaring spire of the company's 450-foot transmission tower.

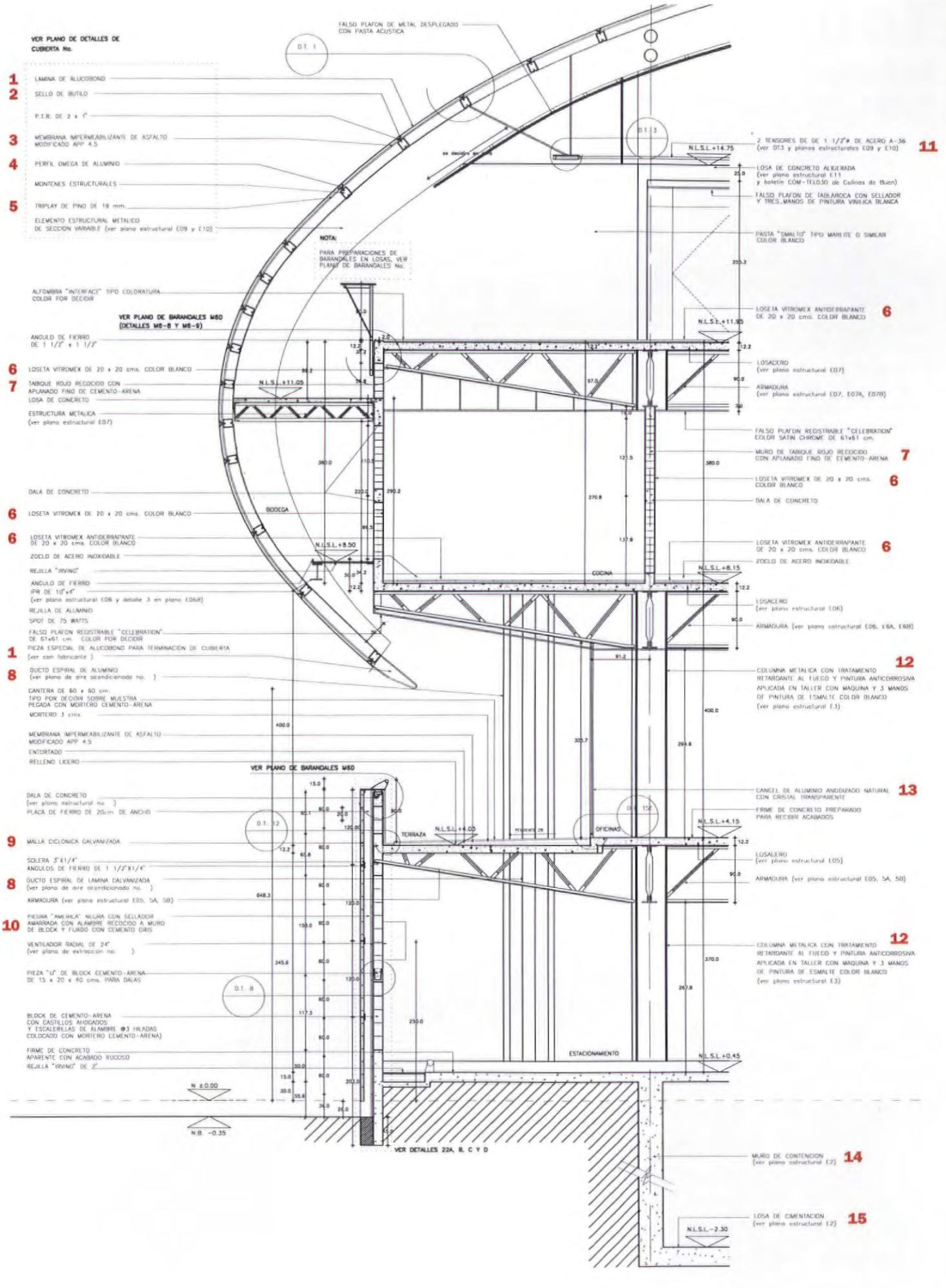
Connecting the building to its surroundings are a series of vertical and horizontal circulation cores. Norten's interest in the transition of type is evident here where two flights of ramps joined by a landing at the office level subsequently provide access to the primary dining facility. Each ramp is cantilevered from a vertical plane that simultaneously serves as a street level billboard establishing an architectural vocabulary through the use of visual media where the billboard assumes the structural and spatial role of a wall.

Although Norten is the highest-profile hi-tech architect in Mexico today, the trend away from national folkloric approches towards a more realistic emphasis on technique and typology is also manifested in the work of architects such as Isaac Broid and Luis Vicent Flores. Interestingly it is Ricardo Legorreta, an architect at the opposite end of the stylistic spectrum, that Televisa have chosen to design their new headquarter's building which went on site at the end of last year. They could not have chosen two more contrasting architects for consecutive commissions. KM **WA**

Top *Computer generated diagram of the curve of the roof. Each pane of glass had to be individually cut to fit the trapezoidal plan.* ***Above left*** *The glass facade or "eye" of the building at night.* ***Above right*** *Staff dining in the main space. Photographer: Luis Gordoa*

Key

1 Sheet of *alucobond*
2 Seal of *butilo*
3 Asphalt waterproof membrane
4 Omega aluminium profile
5 Pine triple-ply
6 Small slab of vitromex (non-slippery)
7 Wall of red annealed bricks with smoothed finish of cement and sand and concrete
8 Ductile spiral of aluminium
9 Galvanised ciclonic wire mesh
10 American black stone with seal
11 False plate of folded metal with acoustic paste
12 Metallic column with fire retard treatment
13 Partition of natural anodised aluminium with transparent glass
14 Containing wall
15 Foundation slab


VER PLANO DE DETALLES DE CUBIERTA No.
1 LAMINA DE ALUCOBOND
2 SELLO DE BUTILO
P.T.R. DE 2 x 1"
3 MEMBRANA IMPERMEABILIZANTE DE ASFALTO MODIFICADO APP 4.5
4 PERFIL OMEGA DE ALUMINIO
MONTENES ESTRUCTURALES
5 TRIPLAY DE PINO DE 19 mm.
ELEMENTO ESTRUCTURAL METALICO DE SECCION VARIABLE (ver plano estructural E09 y E10)
FALSO PLAFON DE METAL DESPLEGADO CON PASTA ACUSTICA
D.T. 1
D.T. 3
N.L.S.L.+14.75
2 TENSORES DE DE 1 1/2"ø DE ACERO A-36 (ver DT.3 y planos estructurales E09 y E10) 11
LOSA DE CONCRETO ALIGERADA (ver plano estructural E11 y boletin COM-TEL.30 de Colinas de Buen)
FALSO PLAFON DE TABLAROCA CON SELLADOR Y TRES MANOS DE PINTURA VINILICA BLANCA
PASTA "SMALTO" TIPO MARLITE O SIMILAR COLOR BLANCO
NOTA:
PARA PREPARACIONES DE BARANDALES EN LOSAS, VER PLANO DE BARANDALES No.
ALFOMBRA "INTERFACE" TIPO COLORATURA COLOR POR DECIDIR
VER PLANO DE BARANDALES M60 (DETALLES M6-8 Y M6-9)
ANGULO DE FIERRO DE 1 1/2" x 1 1/2"
6 LOSETA VITROMEX DE 20 x 20 cms. COLOR BLANCO
7 TABIQUE ROJO RECOCIDO CON APLANADO FINO DE CEMENTO-ARENA
LOSA DE CONCRETO
ESTRUCTURA METALICA (ver plano estructural E07)
N.L.S.L.+11.05
LOSETA VITROMEX ANTIDERRAPANTE DE 20 x 20 cms. COLOR BLANCO 6
N.L.S.L.+11.95
LOSACERO (ver plano estructural E07)
ARMADURA (ver plano estructural E07, E07A, E07B)
FALSO PLAFON REDISTRABLE "CELEBRATION" COLOR SATIN CHROME DE 61x61 cm.
MURO DE TABIQUE ROJO RECOCIDO CON APLANADO FINO DE CEMENTO-ARENA 7
LOSETA VITROMEX DE 20 x 20 cms. COLOR BLANCO 6
DALA DE CONCRETO
BODEGA
COCINA
N.L.S.L.+8.50
N.L.S.L.+8.15
ZOCLO DE ACERO INOXIDABLE
REJILLA "IRVING"
ANGULO DE FIERRO IPR DE 10"x4" (ver plano estructural E06 y detalle 3 en plano E06A)
REJILLA DE ALUMINIO
SPOT DE 75 WATTS
FALSO PLAFON REDISTRABLE "CELEBRATION" DE 61x61 cm. COLOR POR DECIDIR
1 PIEZA ESPECIAL DE ALUCOBOND PARA TERMINACION DE CUBIERTA (ver con fabricante)
8 DUCTO ESPIRAL DE ALUMINIO (ver plano de aire acondicionado no.)
CANTERA DE 60 x 60 cm. TIPO POR DECIDIR SOBRE MUESTRA PEGADA CON MORTERO CEMENTO-ARENA
MORTERO .5 cms.
MEMBRANA IMPERMEABILIZANTE DE ASFALTO MODIFICADO APP 4.5
ENTORTADO
RELLENO LIGERO
VER PLANO DE BARANDALES M60
DALA DE CONCRETO (ver plano estructural no.)
PLACA DE FIERRO DE 20cm DE ANCHO
D.T. 12
9 MALLA CICLONICA GALVANIZADA
SOLERA 3"X1/4"
ANGULOS DE FIERRO DE 1 1/2"X1/4"
8 DUCTO ESPIRAL DE LAMINA GALVANIZADA (ver plano de aire acondicionado no.)
ARMADURA (ver plano estructural E05, 5A, 5B)
10 PIEDRA "AMERICA" NILURA CON SELLADOR AMARRADA CON ALAMBRE RECOCIDO A MURO DE BLOCK Y FIJADO CON CEMENTO GRIS
VENTILADOR RADIAL DE 24" (ver plano de extraccion no.)
PIEZA "U" DE BLOCK CEMENTO-ARENA DE 15 x 20 x 40 cms. PARA DALAS
D.T. 8
BLOCK DE CEMENTO-ARENA CON CASTILLOS AHOGADOS Y ESCALERILLAS DE ALAMBRE @3 HILADAS COLOCADO CON MORTERO CEMENTO-ARENA)
FIRME DE CONCRETO APARENTE CON ACABADO RUGOSO
REJILLA "IRVING" DE 2"
N ±0.00
N.B. -0.35
TERRAZA
N.L.S.L.+4.05
PENDIENTE 2%
D.T. 15Z
OFICINAS
N.L.S.L.+4.15
CANCEL DE ALUMINIO ANODIZADO NATURAL CON CRISTAL TRANSPARENTE 13
FIRME DE CONCRETO PREPARADO PARA RECIBIR ACABADOS
LOSACERO (ver plano estructural E05)
ARMADURA (ver plano estructural E05, 5A, 5B)
12 COLUMNA METALICA CON TRATAMIENTO RETARDANTE AL FUEGO Y PINTURA ANTICORROSIVA APLICADA EN TALLER CON MAQUINA Y 3 MANOS DE PINTURA DE ESMALTE COLOR BLANCO (ver plano estructural E3)
ESTACIONAMIENTO
N.L.S.L.+0.45
VER DETALLES 22A, B, C Y D
MURO DE CONTENCION (ver plano estructural E2) 14
LOSA DE CIMENTACION (ver plano estructural E2) 15
N.L.S.L.-2.30

Tourist trap

Project: Charter terminal, Cancun International airport
Architect: Augusto Quijano Arquitectos

The dollar rich influx of tourists in Mexico is expected to increase. In fact, Augusto Quijano has already been commissioned to design two futher extensions, of over 12,000 square metres, to his recently finished airport scheme. When complete the extensions will provide 18,500 square metres of space to accommodate Mexico-bound holiday makers by the millennium. Although this might seem fast, by Quijano's standards it is perfectly achievable because the first building took only four and a half months from drawing board to completion.

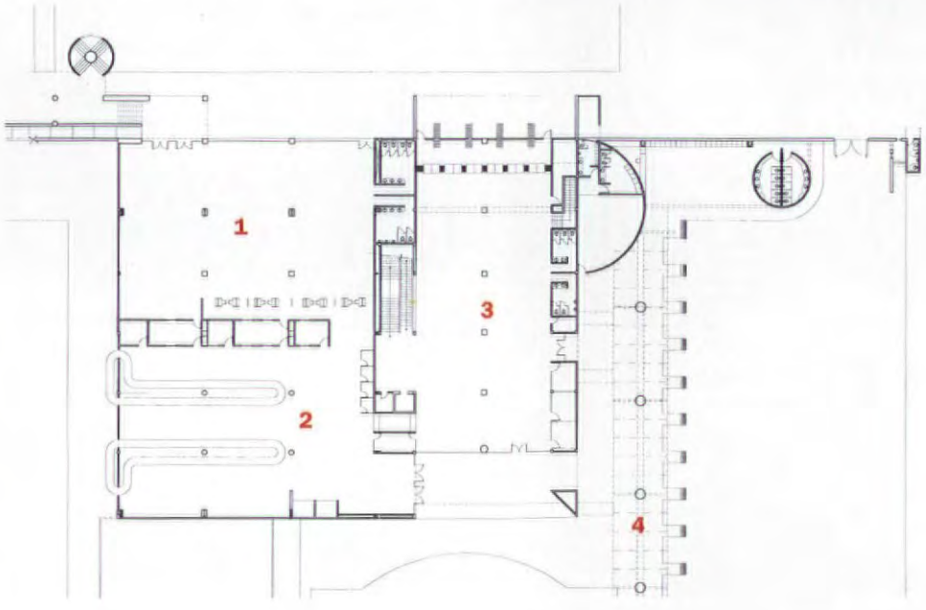
The airport is constructed from a steel and concrete frame with internal walls of sheet rock. The rounded forms of the outside walls, divided at uneven intervals by open strips, are more abstract than those of his earlier Confia bank tower in Merida.

"In the Yucatan we have very hard sun light which must be used to enhance the form by producing shadows, outdoor/indoor transitions and environmental relationships".

The airport is designed around four main areas: documentation, boarding hall, immigration and baggage claim without interior passageways to facilitate efficient movement between each area. Making full use of the climate of the Gulf of Mexico, the entry hall is open providing a smooth transition from the heat of the day to cool the airy interior lobby. The hall connects the documentation hall with the exit from the baggage claim and customs area.

In the design of his office in Merida – the project for which he won the Grand-prix gold medal in the third Biennale of Mexican architecture in 1994 – Quijano revealed an almost obsessive desire to create a visual link between the interior and exterior space where the internal glass walls are glass look into a central courtyard and through into the garden behind. The design for the airport develops this idea further by creating a visual rather than physical link with the outside; the boarding hallway is comprised of a series of linked walkways behind an articulated glass facade that affords a close up view of the aircraft. KM **WA**

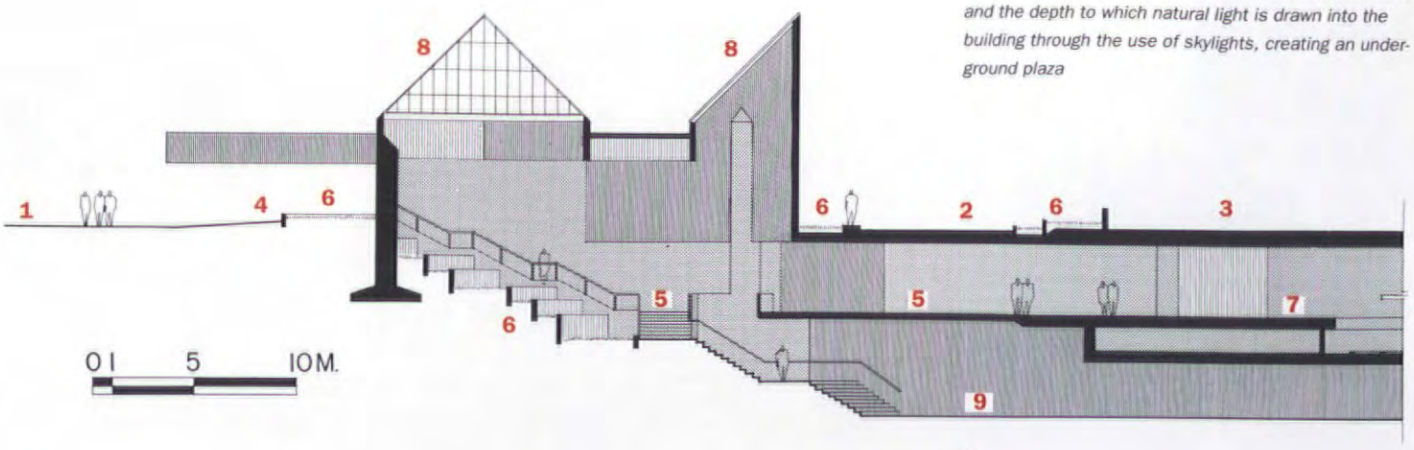
Top *Entrance showing Quijano's interest in the relationship between interior and exterior space.* ***Above*** *The glass-fronted cafe affords views of the aircraft.* ***Left*** *The outside walls are divided at intervals by open strips further emphasising the continuation between exterior and interior spaces.* ***Below*** *Quijano's plan is designed as a unit which can easily be extended without subtracting from the original concept. Photographer: Roberto Cardenas Cabello*



Key

1 Immigration
2 Baggage claim
3 Documentation
4 Buses dock

Client:	Cancun Air
Structural engineers:	Eduardo Suarez ingeniero
Service engineer:	Heredia construction
Lighting consultant:	Jose Vazquez
Contractor:	Eduardo Suarez



Below *A section through the station showing the access and the depth to which natural light is drawn into the building through the use of skylights, creating an underground plaza*

Key

1 Plaza (street level)
2 Connecting alley
3 Javier Mina Avenue
4 Entrance from plaza (Pergolas above)
5 Vestibule
6 Planters
7 Dock; access to trains
8 Skylight
9 Pedestrian tunnel under tracks

Time Zohn

Project: North entrance – San Juan de Dios metro
Architect: Alejandro Zohn y Asociados

"Here we have a little more history, and there in Monterrey" Alejandro Zohn says from his office in Guadalajara, "they have a little more money". As the second "cultural" capital after Mexico City, Guadalajarans have become increasingly aware of the need for more careful urban planning, but Zohn has been actively involved in this area since the 1950s. His latest project is the entrance to the San Juan de Dios metro station in Guadalajara which is situated between the uncompromisingly modernist Libertad market that he built in 1959, and a footbridge across the adjacent motorway that he designed five years ago.

The metro station is a confluence of internationalism: as a result of devaluation, private funds were sought – it was partly financed by German industrialists including Siemans and the rolling stock came from France. The Mexican architect wanted to give it a "symbolic value making the public aware of a new train line in a move to relieve the congestion and consequent pollution of the city" in order to encourage Guadlajarans to adopt a responsiblity for contamination that is equal or better than that of the European investors.

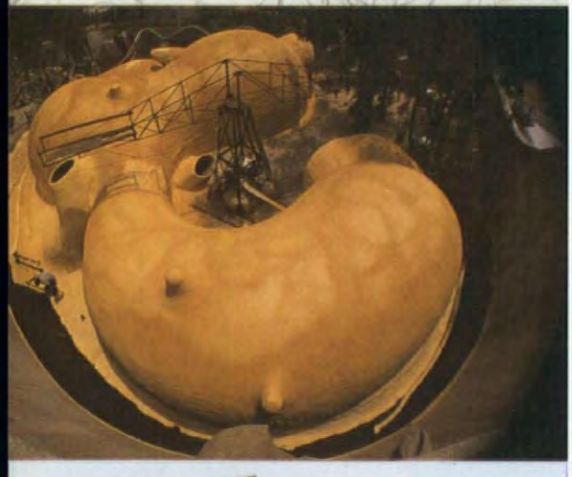
Within the courtyard of the Libertad market Zohn was one of the first architects to remodel an urban plaza. When he accepted the commission for San Juan de Dios he insisted on remodelling the adjacent space in order "to accommodate the new pedestrian traffic patterns without disturbing the existing trees – the basic idea was to bring the plaza, vegetation included, right down into the station". Two symmetrical entrances are accentuated with triangular pergolas and lead to the interior stairs which flank a stepped sequence of planters. The access doors form part of a steel lattice, letting air, light flow in from the plaza, thus harmonising with the local climatic conditions. KM **WA**

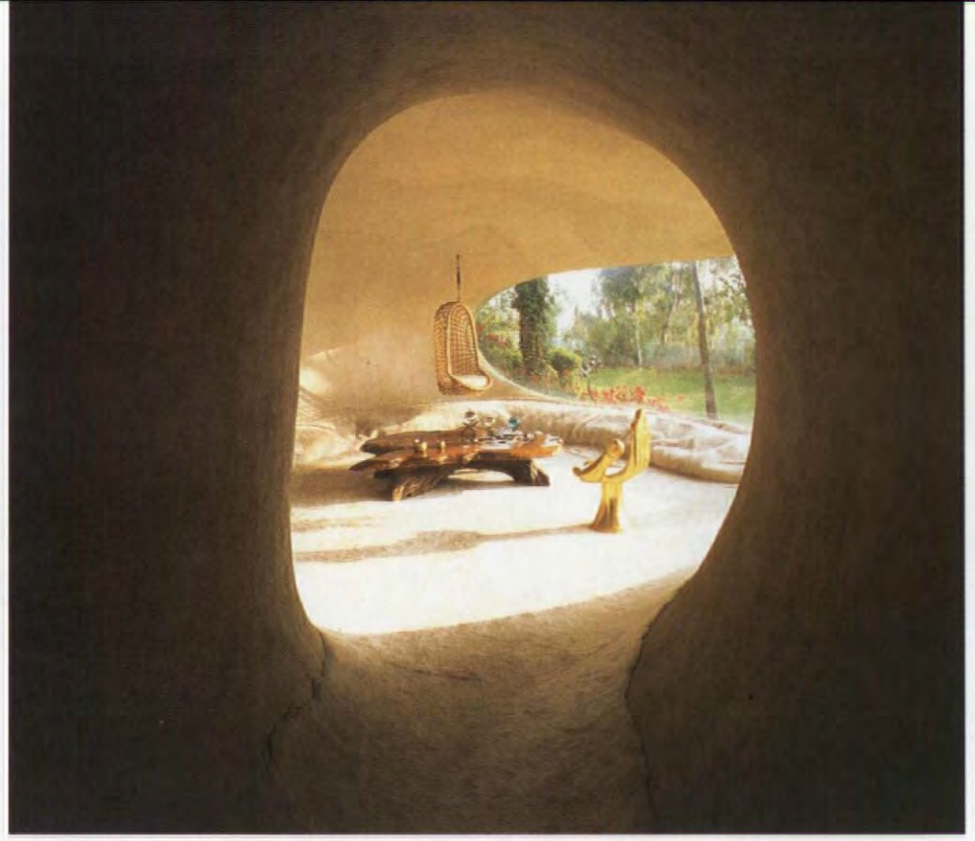
Above *The cascading system of planted terraces combine with the filtered sunlight to create a light, airy space.* ***Left*** *Zohn insisted on designing the plaza and has created the angluar skylights of the station entrance to compliment the roof of the Libertad market which he built in 1959, seen in the background. To the right of the picture is Zohn's pedestrian bridge, testimony to the influence he has had on the design of this city centre over three and a half decades*

Client:	Jalisco State Government
Structural engineer:	Ing Roberto Davalos Lopez
Service engineer:	Constructora Tlaloc, SA de CV
Contractor:	Ingenieros BBC, SA de CV


Mexican
mole

The womb-like underground spaces created by the Mexican architect Javier Senosian Aguilar draw on his "Gaudi-esque" Spanish heritage, mixed with a Mexican sensibility for the need for more housing. Senosian's house started off as a private enterprise but the pneumatic technique that developed from it, which involves covering an inflated structure with foam that hardens and remains after deflation, has proved to be an efficient way of creating mass housing. Katherine MacInnes goes underground to investigate Senosian's ideas. Photography Christoph Kicherer.





Instead of using tunnel-blasting techniques to build on this rocky hillside above Mexico City, Senosian's troglodyte dwelling developed, organically. He shaped chicken wire into a form which harmonised with the terrain then sprayed a layer of concrete over it before waterproofing and overlaying with turf.

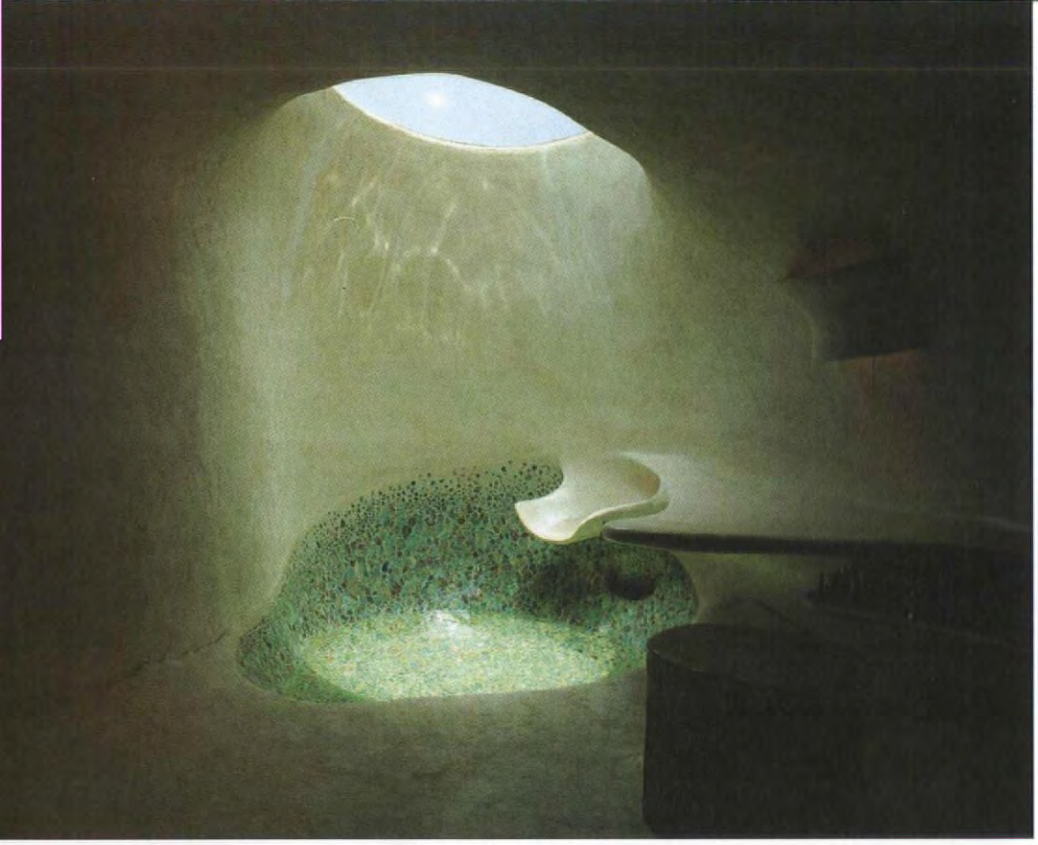
The microclimate that results is one of the most persuasive reasons for introducing this technique. If it could be applied on a larger scale it could help solve the city's chronic pollution problem: "After 15 minutes of watering the lawn, the air clears. It is as if the building is sweating." In a city, a grass roof provides an important habitat for wildlife and it actively cleans the air. "Eco-roofs help clean the atmosphere because grass absorbs carbon-dioxide. It also reduces the demand on fossil fuels since the earth's coating is a natural insulator and maintains a constant interior temperature of 17-23 degrees centigrade."

Senosian believes that curved spaces are more suited to human well-being than conventional rectilinear rooms. In his recent book *Bio Arquitectura – En Busca de un espacio* he claims to have been inspired by a wide cross-section of human containers from the womb, to primitive cave dwellings, African round huts and igloos. In the field of modern architecture, Senosian particularly admires the Argentinian architect Eladio Dieste who uses "hard materials to create soft architecture" and Juan O'Gorman, an architect from the school of the famous Mexican muralists Rivera, Orozco and Siqueiros whose art "combined social realism with the dynamics of nature". But he admits that his main inspiration is the Spanish architect, Antoni Gaudí.

Senosian concedes that designing and adapting to a space in which straight lines are strictly banned does not come automatically: "You need to make mental changes and study the tiny details of daily life in order to pre-empt your needs". The beauty of an organic plan is that you can add to it without destroying the symmetry. As his family grew, Senosian added more rooms onto the original foetal shape. "The problem of seeing who was at the front door onto the street from below ground was solved by installing a periscope." In order to avoid claustrophobia, Senosian has lit the tubular corridors with psychedelic light through tinted skylights to "dematerialise" the walls with a slightly disorientating effect. "Walk in the centre" Senosian advises, "and only one at a time".

So how can such a customised technique, where even the furniture is site specific, be adapted to mass production. "It started with the tiled house, Casa Embrión" Senosian explained. "I designed a huge pneumatic structure in the shape of the house: two bedrooms, kitchen, sitting room and bathrooms etcetera. It was inflated, covered in a quick drying hard polystyrene foam and then deflated. The whole process took about three days." Since then, Senosian has designed with a standard pneumatic mould for a family house and experimented with prefabricated organic units for an underground satelite development also in Mexico City.

His vision for the year 2000 is an oasis of troglodyte dwellings: "it is a formula which can be applied equally well to small villages and large cities. We are arriving at a stage where a more integrated method of living must become a reality. I am trying to make realistic proposals for the future". WA



"To those who know the human skeleton and its functions, I tell you that I study and learn from it. Because these are the structures where the absolute plan doesn't exist but from which living shapes are derived."

Antoni Gaudí

Previous spread left *Senosian's first troglodyte creation, his family house in Mexico City. Skylights illuminate the underground spaces. The turf roof provides a microclimate away from the smog of the city.* ***Previous spread right*** *Tubular corridors are lit with psychedelic light to dematerialise the walls and prevent claustrophobia.* ***Opposite left from above*** *The wire mesh skeleton for Senosians home; the concept sketch for the foetal plan of his house; the polysytrene foam sprayed onto the pneumatic form sets hard within two days; a prototype pre-fabricated housing unit is lifted into place.* ***Opposite above right*** *The family room of Senosian's house looking onto the garden.*

Clockwise from above left *Bathroom in Senosian's house uses the play of natural light on water; a community of Senosian's troglodyte housing units in Mexico City; the plan of each unit showing a growing tendency towards symmetry; the facade of the house showing large acetate window to make maximum use of natural light*

Books

MODERN MEXICAN MASTERS

Mexico 90s. *By Miguel Adria. Editorial Gustavo Fili, SA Barcelona, 152pp, colour and b/w illustrations (paperback). 265 Mex. Pesos/US$35*

Reviewed by Louise Noelle Merelles

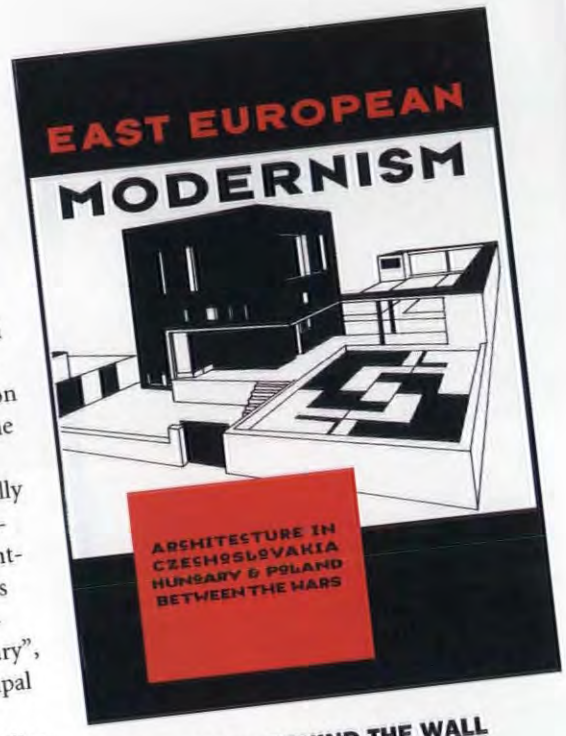
This book should be seen in the context of the publisher, Gustavo Gili's, architectural list. Gili has played an important role in establishing modern Mexican architecture on an international level: "Catálogos de Arquitectura" focused on architects like Enrique Norten, Augusto H Álvarez, Agustín Hernández, Sánchez Arquitectos and Albin-Vazcocelos-Elizondo, but more recently its proactive approach has prompted the two volumes on México: *Nueva Arquitectura* by Antonio Toca and Aníbal Figueroa.

The specialist reader will find in Miguel Adriá's publication a well produced bilingual publication. The visual content is emphasised, perhaps at the expense of the depth of the accompanying text and the diversity of the projects that were selected. It has three introductory essays in Spanish and English, by Richard Ingersoll, Humberto Ricalde and Adría himself. In *A Silent Reproach* Ingersoll expresses a personal appraisal of the work of a country that he does not appear to know in depth. Here and there, the text is confused and even mistaken, often expressing opinions that several local historians do not share.

Adriá's vision of the quality and diversity of current work is clear and, even if the analysis is restricted to previously selected works, he manages to express a series of interesting and acute opinions.

Ricalde alleges that the cultural complexity of a nation such as Mexico bears upon its complex artistic expressions from extreme nationalism to the open adoption of imported patterns. Adriá picks the guiding trend, comparing some successful trends "with a tradition ...[that] has tended to channel creativity in the direction of the stereotype... frustrating the expression of a rich and complex country fully capable of assimilating the current globalisation...", thus favoring the international avant-garde movements. Then the author declares that the selection of the works that are presented is "somewhat subjective and arbitrary", with the architectonic quality as the principal element of judgement.

Probably the principal value of this publication resides in the buildings: 17, designed by the same number of ateliers, formed by individual or associated architects. In each case, the presentation opens with a brief descriptive text facing a large photo that tries to encapsulate the essence of each design. Plans and sections follow with a good selection of colour and black and white graph material. The number of pages devoted does not appear to follow any rational order. The selection includes recognised professionals such as Teodoro González de León, Ricardo Legorreta, Abraham Zabludovsky, and more up-and-coming ateliers such as Carlos Mijares, Francisco Serrano, Andrés Casillas and TEN. Among the younger generation, one can give a mention to Sánchez Arquitectos, Sordo Madaleno y Asociados, Isaac Broid, López Baz/Calleja, Albin/Vasconcelos/Elizondo, and Landa/Alesio-Robles, based on the quality of a good number of their projects. This list includes Augusto Quijano, the only architect who does not reside in Mexico City, demonstrating an uneven distribution of designers. The list comes to an end with Aja/Ondarza/Santos, Gantous/Gantous/Hamui, Luis Vicente Flores and a group of students under the co-ordination of Gabriel Mérigo of the National University. The lack of a small bibliography, and the inequality of the biographies that close the publication, constitute the loss of an opportunity to inform the reader of other latitudes.



LOOK WHAT'S BEHIND THE WALL

East European Modernism: Architecture in Czechoslovakia, Hungary and Poland between the wars. *Edited by Wojciech Lesnikowski. Thames and Hudson. 304pp, 240 b/w illustrations. £28 (hardback)*

Reviewed by David Crowley

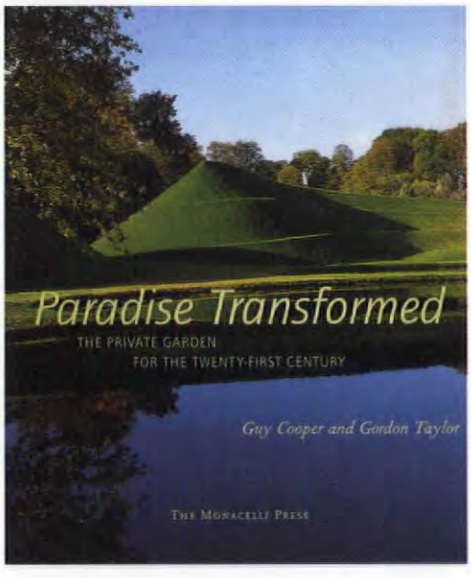
Historians of the modern movement between the wars have always had a rather limited collection of buildings to study. Until recently full-blown modernism of the 1920s and 1930s has seemed very much a French and German affair. However, since communism began to wane in Moscow's satellite states – as Wojciech Lesnikowski claims in his introduction to *East European Modernism* – the precocious accomplishments of Polish, Hungarian and Czechoslovakian modernist designers has come under international scrutiny. On the evidence of the eight essays and numerous illustrations contained in this book, modernist architecture in Central Europe was a thriving and extensive practice which even encompassed entire new towns built according to Congrès Internationaux d'Architecture Moderne (CIAM) principles such as Gdynia, Poland's narrow toehold on the Baltic, or Zlín, a factory-town built by the company Bat'a, in rural Moravia. Even in Hungary after 1919, where Horthy's right-

wing regime had little interest in supporting the social and political aspirations of Hungary's modernists, a remarkable range of sophisticated villas were built for enlightened patrons in the fashionable Buda hills.

Despite the unfamiliarity of many of the names and locations, the architectural language of brilliantly-glazed facades, bleached white walls, flat-roofs, plastic plans and expressive elevations needs little explanation. Lesnikowski and his fellow contributors are unequivocal in their celebrations of what they call "functionalism" between the wars. The book's often disappointing, small black and white photographs illustrate, for the main part, a group of essays dealing with the biographies of modern movement architects; their international alliances as members of the bodies like CIAM; and their local disputes. This is unfortunately such an enormous cast that too few architects or buildings are discussed in any detail.

In addition – and to my mind more interestingly – the architecture of each country is treated to a small essay which sets "functional aesthetic" against contemporary, competing currents: national styles, historicism, eclecticism, expressionism, and so on. In each, traces of the dramatic and particular experience of the turbulence of history in Central Europe can be detected in architectural form. After 1918, Poland and Czechoslovakia – newcomers to the map of Europe – used architecture to represent national history and to stress their right to sovereignty. Rondo-cubist buildings such as Gocár's Legion Bank in Prague (1921-23), for example, can only be understood in the light of Czechoslovak national pride. Such forms of architecture parlante, whether conservative, bizarre or kitsch, were unique – the convergence of political aspirations, local architectural traditions and a quest for novelty. Whilst the architectural merit of much of the eclecticism of inter-war Hungary, Poland and Czechoslovakia is open to debate, it is undoubtedly true that some of the most extraordinary buildings in the region lie outside the universalised and programmatic aesthetic of international modernism. Josef Plecnik's reconstruction of Prague Castle after the First World War and his design for the Sacred Heart church in Vinohrady, both rich and complex meditations on history and memory in architectural form, are the most famous examples.

It is mischievous to review a book that has not been written, but I cannot help wishing for a more pluralist and detailed study suggested by Lesnikowski's subtitle, *Architecture in Czechoslovakia, Hungary and Poland between the wars*, rather than *East European Modernism* alone.



LED UP THE GARDEN PATH

Paradise Transformed: the private garden in the twenty-first century. *Guy Cooper and Gordon Taylor. The Monacelli Press. 224pp, 100 colour illustrations. £35/US$50 (hardback)*

Reviewed by Peter Aldington

At first sight this is an exciting book. It is full of beautiful images of gardens designed and made during the past 20 or so years, many in the US – where the book is published – but including examples from as far afield as Japan, Australia and Europe.

The subtitle *the private garden in the twenty-first century* led this reviewer to anticipate an analysis of the state of the art of garden design today, leading to pointers to the future. However, the authors did not set out with this intention: their appointed task being limited to a "survey of gardens designed since about 1980". So we are presented with an all too brief eight pages of introduction which superficially analyses how the art of landscape design has arrived at wherever it is at the end of the twentieth century, followed by a series of photographs and descriptions of the selected gardens. There is no attempt to appraise, but there is an attempt to classify into "four broad, sometimes overlapping categories: Exploration, Innovation, Tradition and Abstraction". Critics and historians alike seem to be unable to resist the temptation to slot man's creative activities into neat, often irrelevant pockets: the ordering of *Paradise Transformed* offers a good example of categorising actually interfering with the message. It would have been far more useful and revealing to review the gardens geographically. There is not even an index or contents list which does this, and so the reader is left confused about the state of the art in different parts of the world.

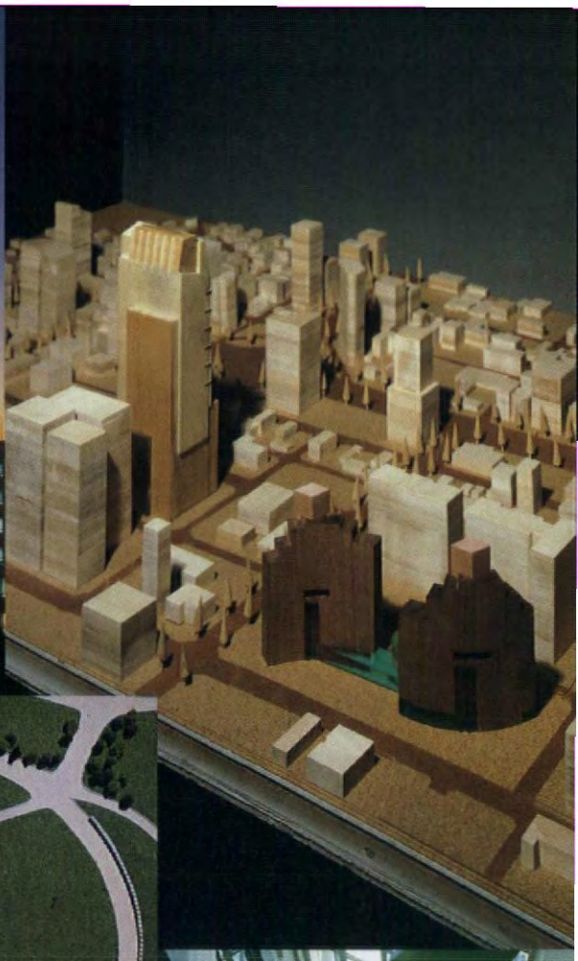
Private gardens do not exist in isolation, but are, by definition, attached to private houses, being the outside part of a whole. Cooper and Taylor have, to a large extent, failed to show this aspect of the gardens they illustrate. Views from the houses into the gardens would have helped as would clearer, more detailed plans and in some cases sections, especially where these would illuminate the designs relationships with their topography.

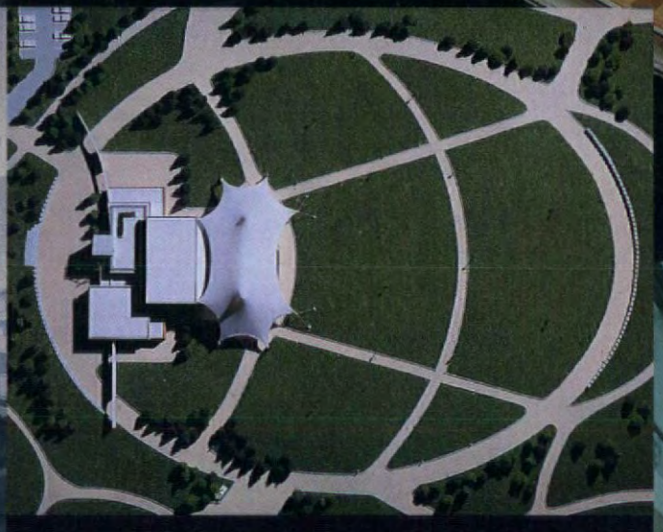
These reservations apart, this is an attractive and stimulating book of images. Its price of £35/US$50 makes it accessible enough to recommend to anyone interested in the art of design and it does reveal that there is a wealth of thinking talent out there. I recommend it to all those architects who think that the garden is less important than the house, and to all those designers who believe that there is no such thing as the twentieth century in garden design. I suspect too that with its excellent bibliography, it will be prove to be a valuable source book for whoever writes the much needed assessment of the twentieth century garden.

BOOKS RECEIVED

Design of Urban Space. Ali Madanipour. Wiley. 240pp, b/w illustrations throughout. £19.99/US$29.95 (paperback), £45/US$75 (hardback)

Arups on Engineering. Editor David Dunster. Ernst & Sohn. 287pp, fully illustrated throughout. £53/DM 128/öS 947/sFr 120 (hardback)





Top left *Glass Tower.* ***Top right*** *Seocho Apartments.* ***Left*** *Togok project.* ***Above*** *Outdoor Music Pavilion.* ***Right*** *Samsung Medical Centre.* ***Below left*** *Seoch Apartments.* ***Below right*** *Training Institute for Small and Medium Industries*

Learning from the future
Samoo Architects & Engineers

Since its creation 20 years ago, Samoo Architects & Engineers has grown to become Korea's largest architectural practice with plans to join the world's top ten by the year 2004. Timothy Ostler looks at how research and development and a long-standing partnership with Korean business giants are keeping the company's plans firmly on course.

Photographs by Tae Oh Kim unless otherwise credited.

Jong-eun Oh

Members of the Board, from left to right:
Senior Principal Chang Soo Kim; Senior Principal Seung Park; Senior Principal, Arch Pool 2 Sang Mook Han; Senior Principal, Arch Pool 4 Seung Hoon Hyun; Senior Principal Suk Ho Lee; Senior Principal, Arch Pool 3 Ju Hwan Cho; Senior Principal, Arch Pool 1 Heung Seh Oh; Senior Principal Management Support Division Kwang Hyun Cho

A Korean bookstore is a feverish place. A weekday evening in the Foreign Language Department in Seoul's Kyobo Book Centre is as frantic as the first day of Harrods' sale, only more earnest. The atmosphere is well summed up by the student in one narrow aisle who is sitting on the floor, heedless of those milling around him, busy copying a complex diagram on to his palm with a ballpoint pen. You are left in no doubt about the value Koreans place on research and development.

To judge from Samoo Architects & Engineers, Korea's architects are no exception. By far the largest firm in the country, thanks to their size and consistent workload they can boast the privilege – rare amongst architects anywhere – of full-time teams devoted to strategic planning and technical development. As a result, Samoo know exactly where they intend to be in 2004, and how they're going to get there.

In most industries it is the firms with the biggest emphasis on research that have the greatest influence on product design, and there is no reason to suppose that architecture should be any different. Samoo's target therefore is to become world leaders not only in terms of size, but also as designers.

"Architecture is not just about aesthetics and sculpture," says Chang Soo Kim, Senior Principal and one of Samoo's founders, "it's a tool which people are going to live in, so function and technology are very important. For example when an aeroplane is beautiful it doesn't mean just the looks – and likewise it's the functional essence that is the most important thing in architecture. The definition of beauty is a combination of technology, environment and function."

Although today Samoo's research and development is underpinned by the resources of a large international company, the emphasis on research has been there since its foundation, in October 1976. Samoo Architectural Research, the firm's original name, accurately reflected its early partners' research activities.

By their second year of practice Samoo had been commissioned to design a 15-storey

◀ Jeong Woong Jae

Opposite page top *Resort Condominium in Sokcho*
Bottom *Inchon International Airport Transportation Centre with Terry Farrell*

Below *Computer perspective of the housing scheme with which Samoo won the PoongnapDong Solar Housing design competition in 1980*

office tower in Seoul. Then in 1980 they won first prize in the PoongnapDong Solar Housing design competition with a project to house 50 families. Between them, these two projects symbolised Samoo's versatility at an early stage in their development.

Samoo means "three friends". Although there were actually five founders, three is a lucky number according to local culture. With hindsight Samoo can fairly claim to have had the best luck in Korea, winning the first of a number of commissions from Samsung just as they were beginning two decades of explosive growth. So began Samoo's most enduring client relationship.

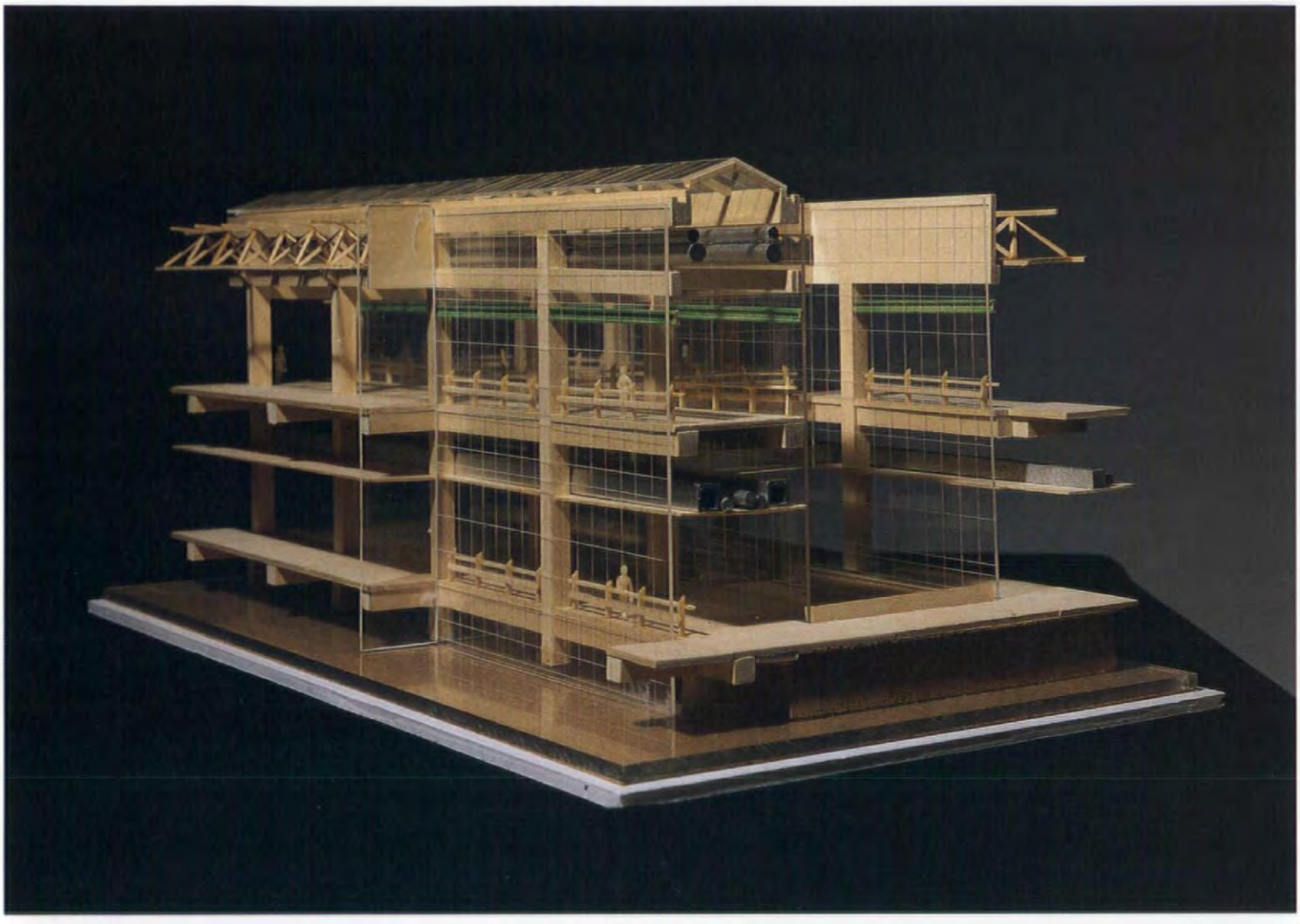
Samsung are now Korea's largest company and have remained Samoo's major clients, accounting for a share of between 60 and 70 percent of their workload. By 1991 Samoo had in turn become Korea's largest firm of architects, with sufficient resources to attract commissions like the masterplan for the 1993 Taejon International Exposition – representing a total investment of US$1.025 billion – or proposals for the Togok project, a *bona fide* giant skyscraper. Today Samoo have developed world-class skills in clean-room and intelligent building design, and they employ three times as many staff as their nearest rival.

Samoo's target for 2004 is to be 1,400 strong, the tenth largest design firm in the world and to have a global presence. Their path to this goal has been carefully mapped out in three phases. The first began in 1994 when, following rapid expansion, the company's management structure was reorganised to provide more flexible allocation of resources. The company was divided into a series of architectural "pools" about 45 strong, each of which was to behave as an autonomous unit with its own business targets. Within each pool, personnel and budgets are allocated amongst four to five project managers according to individual project demands.

In the first phase (1995-1997) Samoo aimed to establish strategic branch offices in Korea and abroad, hiring more foreign design staff and Koreans with international experience. This phase looks to be on track. In the second, from 1998 to 2001, the firm is to establish itself on the international stage, entering the south-east Asian and US markets and establishing a European information network. In the third phase, Samoo intends to achieve the status of a world-class design firm, forming a global network for world-wide projects.

The process of globalisation is the subject of much exhortation in Korea, but for a society with a powerful set of social traditions that don't necessarily tie in naturally with the western economic orthodoxy it raises a few questions. Confucianism remains strong in Korea, and its emphasis on deference to one's elders is still widely observed. For the professional, this tends to mean that one's client base grows larger as one gets older – as a local saying has it, "a doctor with grey hairs gathers patients". Innovation tends to be seen as a by-product of

"In Korea we don't have systems of consultants specialising in various areas so when we design buildings we end up having to do our own research."



Above *Sectional model of the Research and Development Institute for Samsung Motors.*

experience. It's a position that has much appeal, but it's a far cry from the western view, which sees creativity as the preserve of youth.

Samoo are aware of the need to find an accommodation between the two philosophies. "We need to change what has always been the underlying spirit," says Senior Principal Suk Ho Lee. "In order to use people well we have to cut out unnecessary lines of communication and give those people direct authority to make architectural and engineering decisions. That's what we're going to try to do. It's very different from Confucius."

But the issue of respect for elders in Confucianism can be over-stressed, says Lee. "The basis of Confucianism is [above all] humanity." According to Kwang Seog Koh, general manager of the company's Strategic Planning Team, Samoo's pool system allows them to harness creativity on a flatter western model without throwing away the accumulated wisdom of older staff.

The role of strategic planning and research within Samoo has been made both necessary and possible by the structure of Korea's construction industry and by Samoo's relationship with its major client Samsung.

"In Korea we don't have systems of consultants specialising in various areas," explains Chang Soo Kim. "So when we design buildings we end up having to do our own research. If we have a committee that can devote its time to doing research, we get an early start on certain projects."

It seems that the growth of Korea's economy has proved too fast to allow the development of specialist consultancies, which in evolutionary terms require a mature market in order to thrive. So Samoo has had to create its own consultancies in-house.

Fortunately, Samoo's regular flow of work from its major client has given it the space to acquire new skills in anticipation of future work. "For instance," says Kim, "in the case of clean-room design for semi-conductor manufacturing, the fact that we have a regular client means we can establish an in-house resource [in advance of requirements]. If we started when we got the commission we'd be too late."

Kim believes that Samoo's in-house specialist skills will continue to give it a powerful competitive advantage for as long as Korea's construction industry lacks an adequate infrastructure of specialist consultancies. That could be for a long time.

Korea's relationship with the outside world is complex and closely related to domestic political factors. The stand-off with North Korea that has existed for over 40 years has been a perpetual thorn in the side of South Korean politics. As with many other countries that feel themselves under threat, South Korea has conscription, and until recently pre-conscription foreign travel was forbidden as a precaution against draft-dodging. So at just the age when students in other countries might be backpacking across the world, broadening their horizons, Koreans were trapped in their home country.

That has now changed. At the same time, Koreans are finally affluent enough to begin to afford to holiday abroad. The net effect is that Korea is becoming more cosmopolitan.

Samoo are making their own contribution to this process, maintaining a network of international contacts in order to keep track of trends around the world.

"Because of our firm's size and type," says Suk-Ho Lee, "our clients are also very big, and their requirements are big. We don't design small-scale buildings because our clients' requirements are technical and comprehensive. So we look to other foreign companies of the same kind, such as SOM and HOK. We try to see what they do and how they cope with their clients. We sometimes send our employees to learn from them".

"Architecture is not just about aesthetics and sculpture. It's the functional essence that is most important... The definition of beauty is a combination of technology, environment and function."

And what can they learn from Samoo? "I could suggest some little things," says Lee. "But Korea is now a very important architectural market, so when they want to work in Korea, as a local architect Samoo can play a very important role."

Today 15-20 percent of Samoo's workload takes the form of collaborative projects with foreign architects – most notably K Ito in the Samsung Medical Centre, Terry Farrell at Inchon Airport and Botta, Nouvel, Koolhaas/OMA and Farrell at Hannam Cultural Centre, a collaboration that promises to be a major architectural event when it opens in the year 2000. Typically, in these collaborations Samoo's share of the work will range from 30 percent at concept design stage to 70 percent as the design develops.

Samoo's overseas involvement is not limited to working with foreign architects on Korean soil. The company maintains a network of offices across the world. Their role is largely one of interpretation, helping to mediate between Korean companies intending to build in those countries and local architects and contractors. "Clients have difficulty in communicating with foreign architects," says Gibson Rhie, manager of the Strategic Planning Team. "We have the advantage of understanding the production process of that kind of development."

Communication seems to be a strength at Samoo. Their home page, produced in-house by the Computer Technology and Information Team under its general manager Hyung Sup Cho, is an extravaganza of virtual reality flythroughs with musical accompaniment. At the moment it is used mainly as a multimedia portfolio for client presentations, but when adapted and launched on the World Wide Web it will provide a short cut to a global presence.

The growth of the Internet has come about since Samoo first hatched its plan for globalisation, but it fits snugly into it. The pool system within the company dovetails nicely with the development of a corporate intranet that is beginning to allow every staff member to access a range of central services from his or her desktop computer.

As Korea has become more affluent and the emphasis has shifted from heavy industry to electronics, the character of its products has changed. Modern Korean cars, radios, computers, cameras – even fridges and washing machines – are noticeably curvy, colourful and consumer-friendly. Meanwhile as architects, largely trained in engineering colleges, have begun to acquire recognition as something other than just technicians, Korea's architecture is beginning to follow suit.

Samoo have no pretensions to the *avant-garde* – they believe that such things are best left to small design studios. Nor do they dictate any kind of house style to their architects. What they aspire to is work of a consistent, reliable quality. **WA**

Samoo company data

Title of firm
Samoo Architects & Engineers

Head office
Green Building, 79-2 Karak-dong, Songpa-Ku, Seoul, Korea
Tel +82 2 3400 3081
Fax + 82 2 3400 3902
Contact: Myung Gi Sohn, (General Manager, International Business Team)

Branch offices
London, UK; Ridgefield Park, NJ, USA; Austin, TX, USA

Formed 1976

Representative Board
Chang Soo Kim, *KIA*, Senior Principal
Born: Guchang, 1945
Education: BS Architectural Engineering, Korea University, 1968
Career: Architectural Research Lab, Korea University, 1970-76; Senior Principal, Samoo Architects & Engineers, 1976 to date.

Seung Park, *KIA*, Senior Principal
Born: Seoul, 1944
Education: BS Architectural Engineering, Hongik University, 1967
Career: Joong Up Kim & Associates, 1967-1974; Um & Associates, 1974-1975; Senior Principal, Samoo Architects & Engineers, 1977 to date.

Sang Mook Han, *KIA*, Senior Principal, Architectural Pool 2
Born: Jaechun, 1946
Education: BS Architectural Engineering, Hanyang University, 1971
Career: Min Ku Song & Associates, 1971-1974; TAMS, 1974; Senior Principal, Samoo Architects & Engineers, 1979 to date.

Suk Ho Lee, *KIA*, Senior Principal
Born: Seoul, 1942
Education: BS Architectural Engineering, Hanyang University, 1966
Career: Daegyo Industry, 1968-1973; National Assembly Design Task Force Team, 1973; Daelim Construction Co, 1975; various fields of architecture, 1976-1992; Senior Principal, Samoo Architects & Engineers, 1993 to date.

Other members of the board
Seung Hun Hyun, KIA, Architectural Pool 4
Heung Se Oh, KIA, Architectural Pool 1
Ju Hwan Cho, KIA, Architectural Pool 3
Kwang Hyun Cho, Management Support Division

Staff
Employees: 735
Fee-earning architects: 324
Support/admin staff: 117

Turnover
1995: US$70 million
1996: US$95 million (projected)

Major clients (selection)
Bokwang Co
Hotel Shilla
KOACA
Samsung Corporation
Samsung Electronics
Samsung Fine Chemical Company
Samsung Group
Samsung Medical Foundation
Samsung Motors
Suwon City
Tongyang Corporation

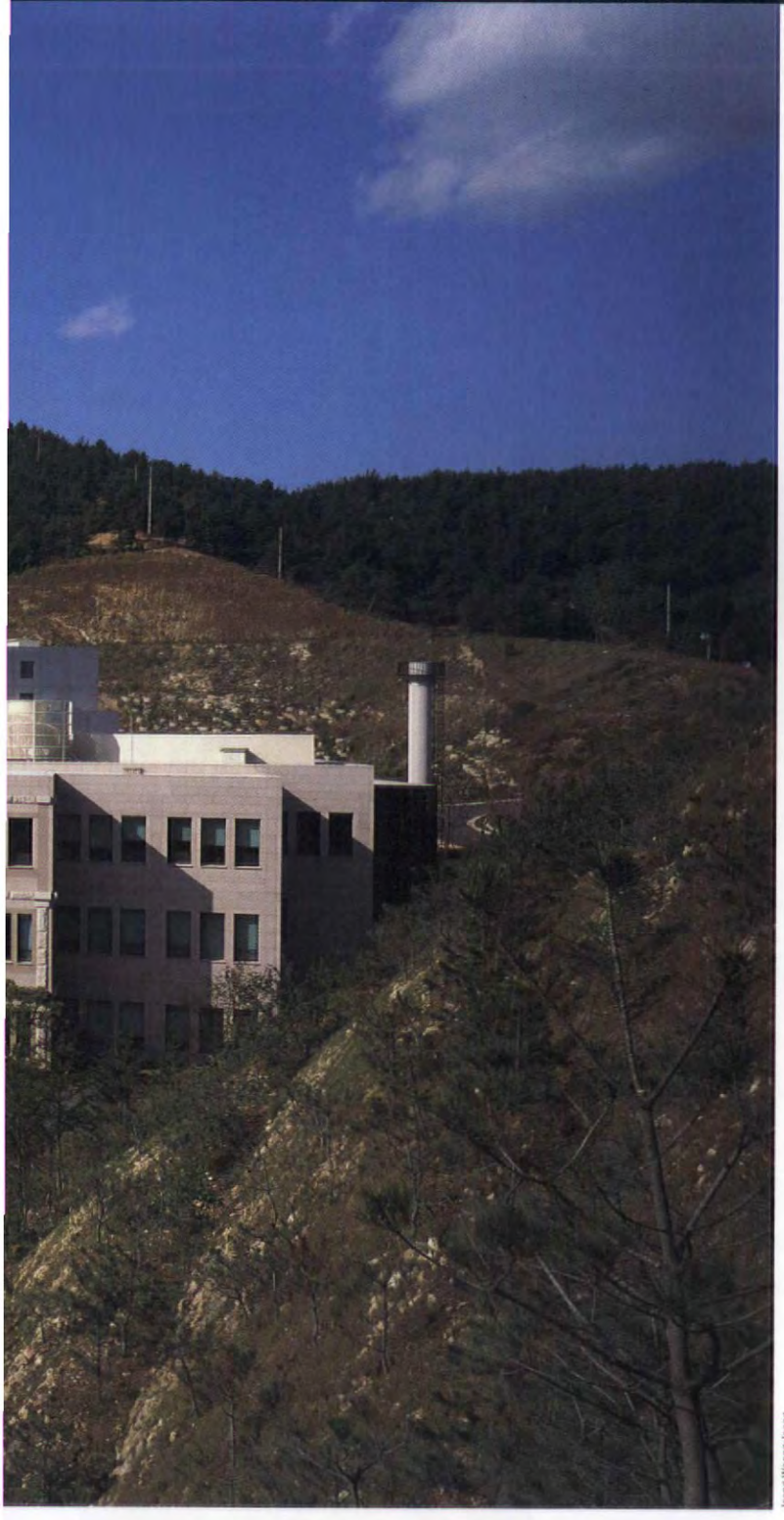
Areas of specialisation
Business parks
Distribution
Healthcare
Hotels/restaurants
Industrial
Interiors
Masterplanning
Offices
Research technology
Residential
Sports
Transportation

Changjo Human Resources Development Centre

Samoo's Changjo Centre for Samsung serves as a powerful symbol of South Korea's training culture and the desire of its largest and oldest company for full integration between tradition and innovation.

Like Samoo, most of the client's progress has come about through the acquisition of new skills on a company-wide scale. Changjo is the most important of around 15-20 training centres where this information is disseminated, and came about through the initiative of Samsung's current chairman, son of the company founder.

Changjo is a building that is quintessentially Korean; the word means "creation" and in its combination of traditional architectural



Jeong Woong Jeong

Left *The main facade is dominated by an oversized gateway modelled on a traditional Korean form. The detailing of the building's stone cladding is based on the stonework of a 2,000-year-old Buddhist temple, and the glazing uses a proportional system found in Korean wood and paper doors.* ***Above*** *The impressive full-height entrance lobby of one of the two halls that flank the entrance gateway*

elements and the modern use of space and materials, the Centre symbolises the way in which creativity is seen as a product of seniority and experience.

The brief called for a 400-seat auditorium, conference facilities, exhibition and leisure meeting rooms, with on-site accommodation for 525 trainees.

Today Samsung is best known for its electronic goods, but as with most of Korea's industrial giants it began as a small family-owned trading company. For all its advanced technological credentials, the company remains deeply convinced of the importance of tradition. Samoo were asked to create the atmosphere of a retreat, placing the Centre carefully in its setting to ensure good *feng shui.*

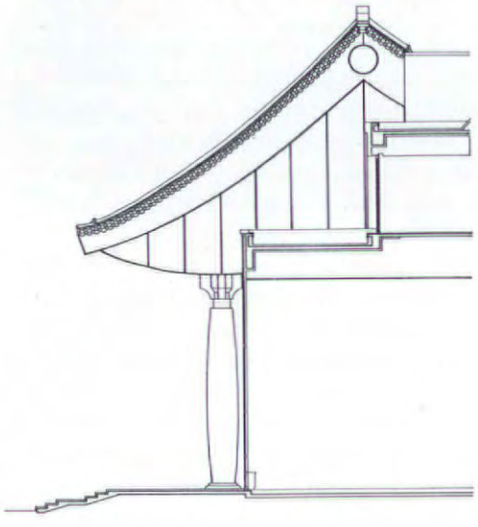
They were helped in this task by the beauty of the site itself. Tucked amongst hills about 50 kilometres from Seoul, it is approached along a parkway which also provides access to a small amusement park and other training centres. With a mountain to the north, hills on either side – a "dragon" on the left, a "tiger" on the right – and a stretch of water in front, its geomantic potential was unusually auspicious.

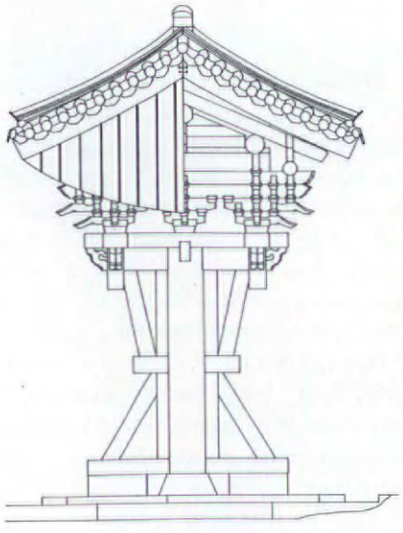
First visible after a final bend in the road, the building's front facade is dominated by a monumental Great Gate flanked by symmetrical modern stone and glass halls. Although the gate is larger scale than in Korean tradition, its form and the transition it implies between public and semi-public space are very familiar to Koreans. Its imposing scale leaves in no doubt the importance with which Samsung views staff training: combined with other common areas, the Great Gate and foyers account for an unusually large proportion of the building's total area.

The general arrangement of the Centre follows Korean historic precedent, with an exterior open space in front and a more private space accessible via a monumental gateway. According to tradition, the former is more activity-oriented (here it includes sports facilities), while the enclosed space normally has a more contemplative atmosphere. In this case the gateway frames a view into a quiet sloped

Jeong Woong Jeong

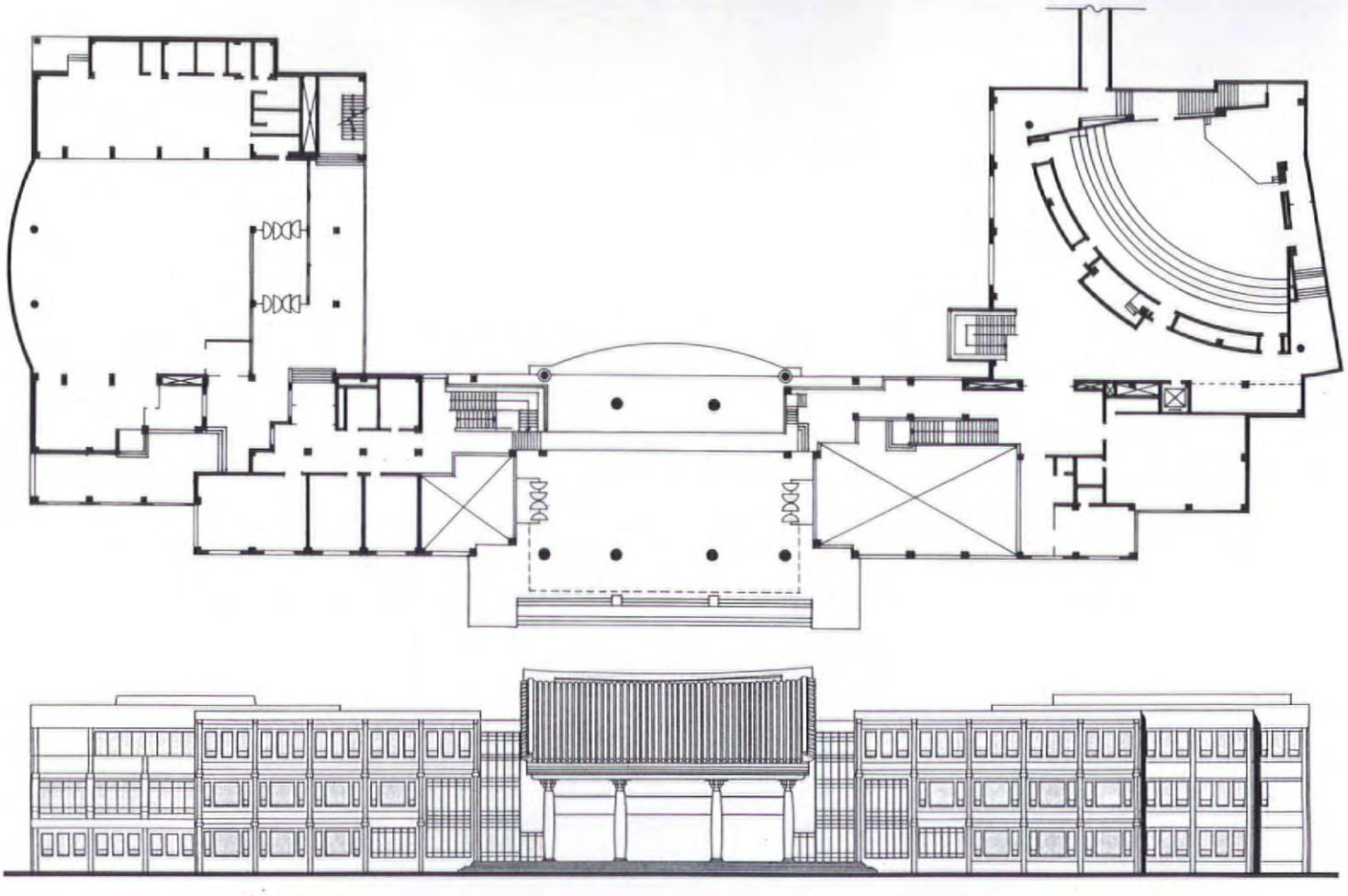
Above *The traditional gateway contrasts strongly with the modern stone and glass halls that flank it.* ***Below*** *Section through entrance gateway compared with a typical traditional Korean Buddhist gateway.* ***Right*** *Detail of model*





Right *The gently sloping courtyard enclosed by the dormitory block at the rear of the complex. Landscaping is used to create a contemplative atmosphere.* ***Below*** *First floor plan.* ***Bottom*** *Main/entrance elevation*

Jeong Woong Jeong



courtyard defined by the dormitory wing to the rear.

Two paths wind up the sculpted hillside amongst rounded topiary and low trees to give access to the dormitory. Although in alignment, trees block the entrance to the dormitory wing from direct view from the main gate. Ample use is made of changing levels to exploit the site's topography, which rises quite steeply towards the rear.

To meet the requirements of separate zones for contemplative and communal activities the main building at the front is itself in two parts: the eastern wing is dedicated to educational functions and includes an auditorium, while the western wing provides administration and dining facilities. A bridge suspended beneath the soffit of the Great Gate provides an exterior link between the two wings, which are also internally connected at upper levels.

On either side of the Great Gate the three-storey wings open up to impressive full-height foyers, glazed using a proportional system derived from traditional Korean doors in paper and wood. When the sun crests the hill to the east they are flooded with sunlight, capturing something of the radiance of temple interiors – an impression that is reinforced by the simple interior finishes of stone and warm wood. Due to the site's steep slope the upper reaches of the courtyard and the dormitory are also lit by the morning sun.

Details of the stone cladding are a reinterpretation of the stonework of Korea's most beautiful shrine, the 2,000-year-old Shilla Dynasty Buddhist temple at Bulkuk in the south-eastern part of the country.

In 1992 Changjo Training Centre won First Prize in South Korea's Architectural Culture Award. **WA**

Right *Model view from west.* ***Below right*** *Computer rendered lobby view.* ***Bottom*** *Third floor plan*

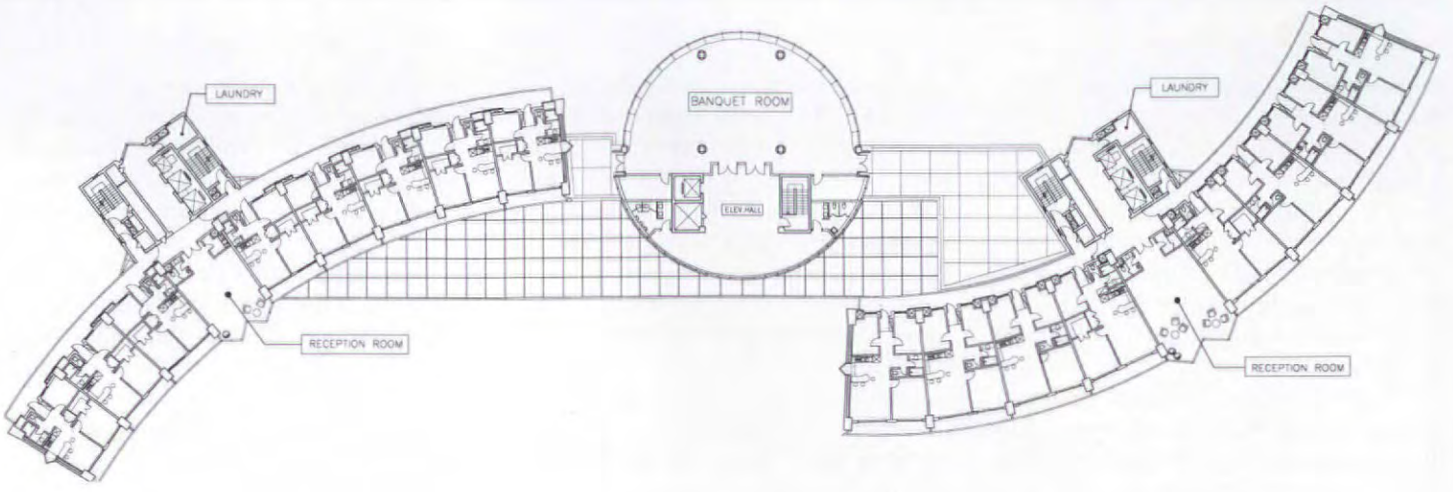
Seocho Apartments

Brief: 300-unit apartment block in a suburb of Seoul.

Challenge: In the rapid economic growth of the last 30 years, the housing market has been hard pressed to keep pace with both demand and lifestyle changes. The project sought to distance itself from the uniform multi-storey concrete slab buildings that have become the norm and which dominate the skyline everywhere in Korea. Samoo were also looking to increase adaptability within units.

Solution: The S-plan configuration introduces a sense of movement into this monotonous grid of "concrete boxes". The southward inflection of the curve respects the tenets of traditional building orientation, in which each unit faces south. In addition, the curve clearly marks the project apart from the existing housing blocks immediately to the east. Conventional Korean housing stock uses bearing wall construction, which hinders change to individual units. Instead, the Seocho apartments uses a concrete frame construction to allow maximum future flexibility. Meanwhile the elevations were designed to diminish the conventional horizontality of housing blocks by articulating the fenestration and creating a stepped roofline. Internally, the development is also unusual in providing a community centre containing restaurants, library, business centre, childcare, fitness and leisure facilities.

Date: 1998



Left *The elliptical plan and column-like ends of the building accentuate its height.* ***Bottom left*** *Site/ground floor plan.* ***Bottom right*** *Typical floor plan*

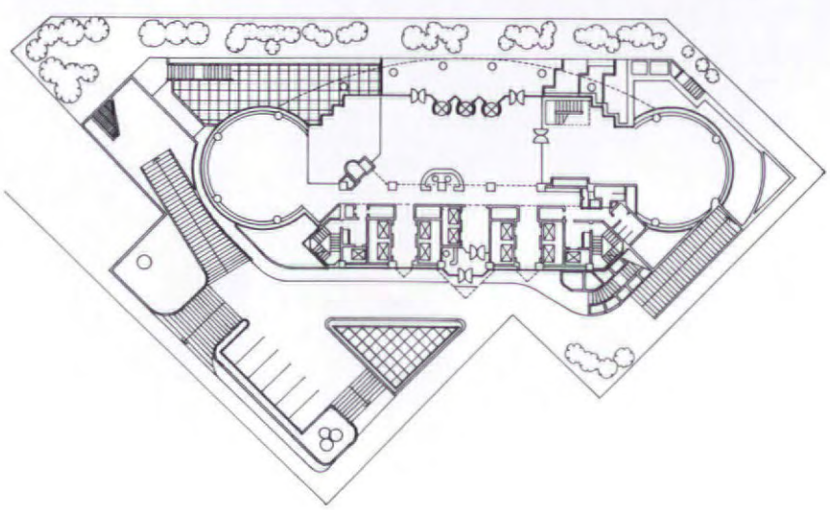
Glass Tower

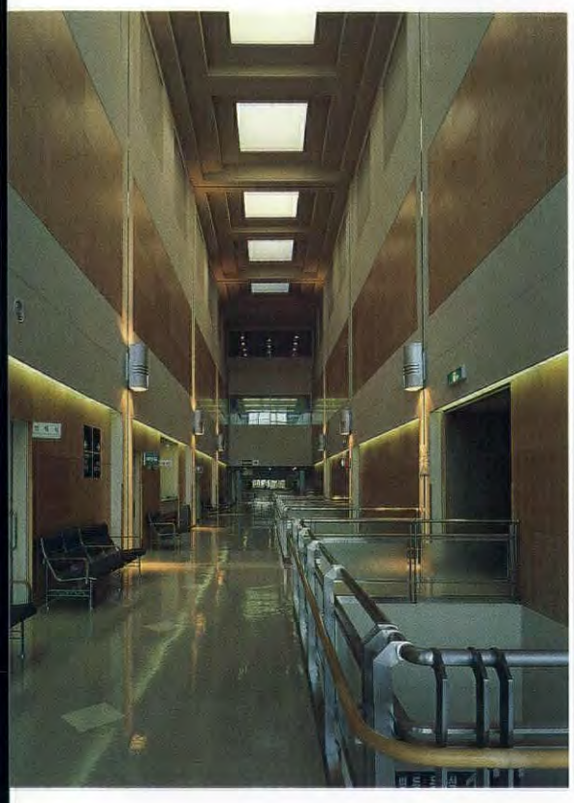
Brief: Samoo were asked to create a building with distinction for a prestigious strategic urban hub. KOEX, the Korean Exhibition Centre, the City Air Terminal and a five-star international hotel all lie directly to the south of the site.

Challenge: Problems Samoo had to overcome included the restricted site, city height ordinances and multiple clients (the site was assembled from land owned by seven separate owners).

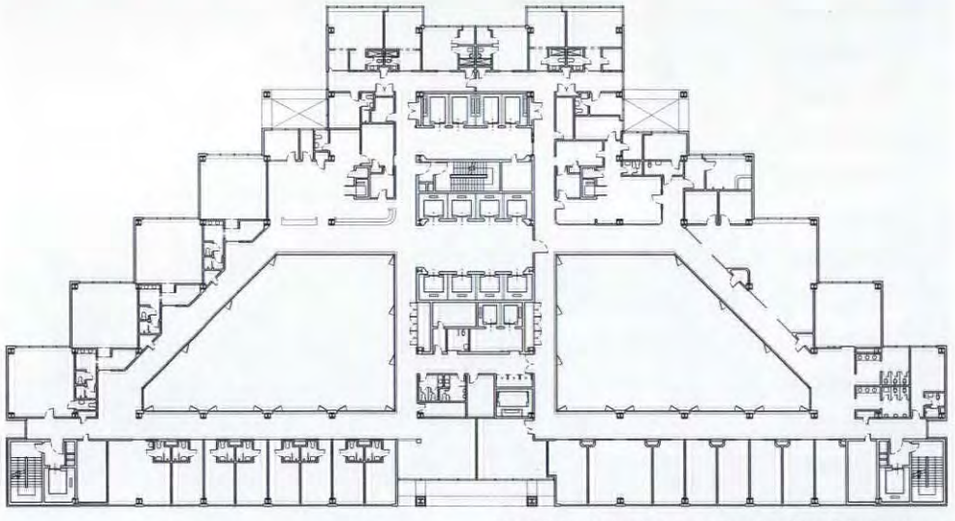
Solution: To make most efficient use of the site, the building was turned 45 degrees off the city grid. This maximised the breadth of the tower facade and left the front of the site open for public space. The scroll-like plan articulates the separation between core and work space, and allows work spaces to benefit from the views available from the open corner. Each end of the plan is treated as an oversize cylindrical column in order to enhance the slenderness of the building and accentuate its apparent height. These "columns" introduce a hierarchy into the organisation of work space and are planned as lounges or executive offices. The elliptical plan form maximises usable area while minimising the building's apparent thickness. The building is reflective by day, but at night it casts aside its corporate reticence and becomes a glowing lantern.

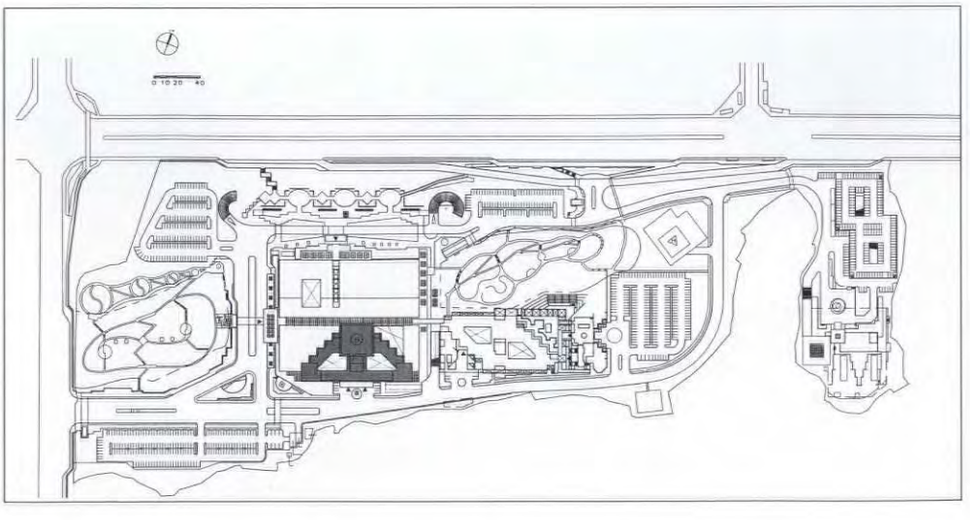
Date: 1995





Jeong Woong Jeong





Top left *View of typical ward corridor.* ***Top right*** *The tower and podium are the first Korean buildings to be clad in stainless steel.* ***Above*** *Typical floor plan.* ***Below*** *Site plan*

Samsung Medical Centre

Brief: 1,100-bed facility for treatment and research located in a southern suburb of Seoul. The project was carried out in association with K. Ito Architects of Japan.

Challenge: This was to be the largest medical centre in Korea, and its sheer size generated problems of circulation, both in terms of efficiency and in terms of orientation.

Solution: The Centre consists of a tower with 20 storeys above ground and three storeys underground, surrounded by supporting facilities in the podium. A large skylit spine connects the main entrance lobby with the clinic waiting areas. The plan of the tower is a stepped triangle with two internal lightwells. Nurse stations are located at the centre of each ward floor. The quality and quantity of waiting space is generous in comparison with existing Korean hospitals and thus emphasises the Centre's desire to be patient-oriented both in terms of circulation and comfort – half of the site is dedicated to open space, primarily for use by visitors and patients. The stainless steel cladding is the first such system in Korea.

Date: 1994

Taejon International Exposition

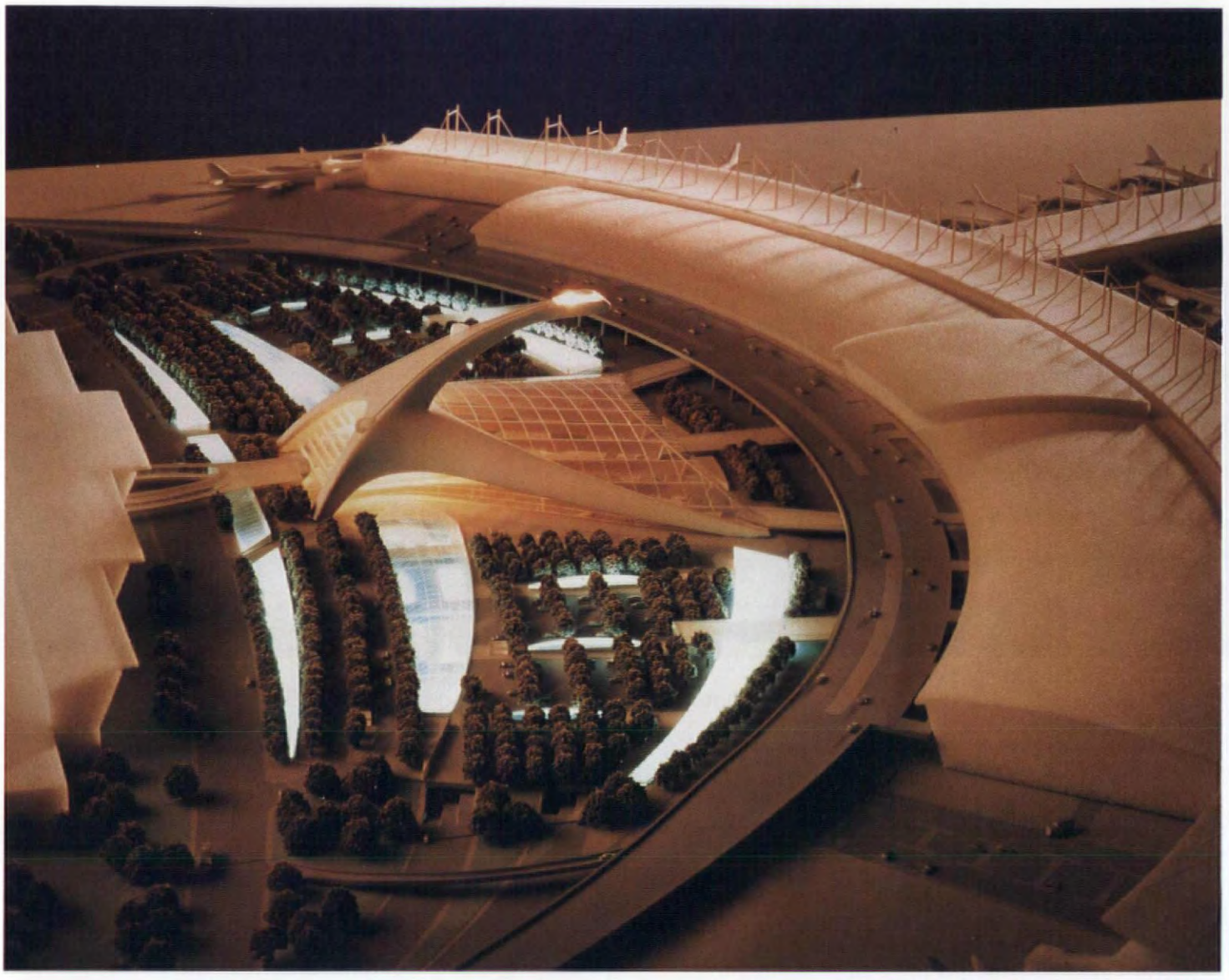
Brief: The exhibition was designed under the theme "The Challenge of a New Road to Development". Samoo worked as masterplanner throughout the project, and as such was responsible for feasibility study, programme development and after-use planning.

Challenge: The project attracted representation from 108 countries, and its design encompassed the full range of complexities involved in planning any international exhibition and its after-use.

Solution: The overall plan aims to create a festive atmosphere throughout the site, and is organised in five sections: the international exhibition area (the main facility); a science park modelled after Disney's EPCOT Center, later to become a theme park; an amusement park with entertainment facilities; maintenance areas; and parking areas. Visitors can enter from three separate directions to reduce congestion. Inside the park, a walkway in the shape of a loop connects the international exhibition and science park with branches giving access to other areas of interest. The international exhibition area is organised by stand and by small outdoor areas encouraging various events. The science park is designed freely as a natural park.

Date: 1992

Above and below *Overall views of the exhibition site.*
Below right *Detail view of the central, tented area*



Above *The control tower and the roof of the Great Hall represent a bird in flight.* ***Below*** *Roof/site plan*

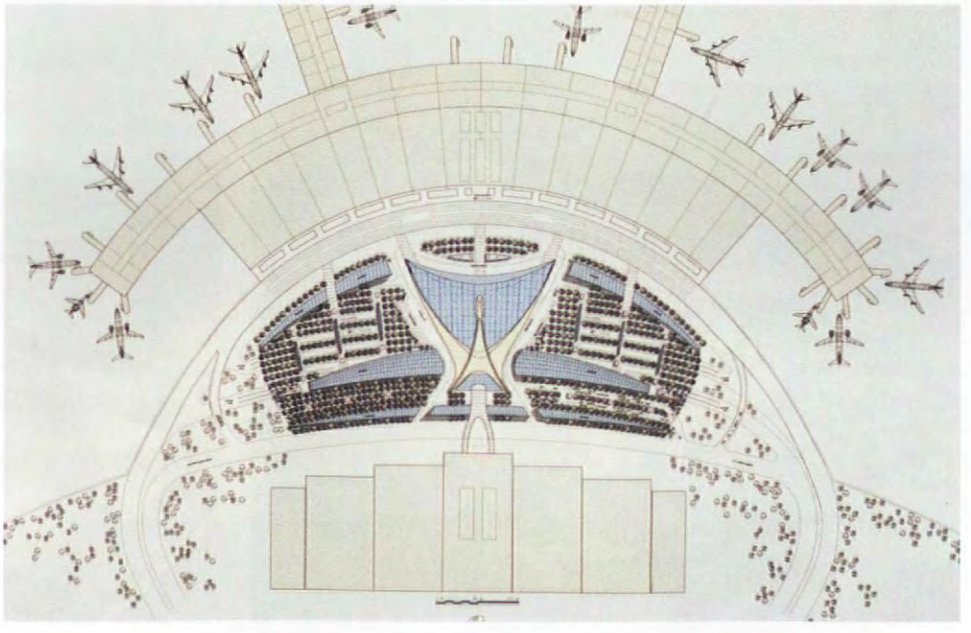
Inchon International Airport Transportation Centre

Brief: One of the world's largest infrastructure projects currently under development, Inchon International Airport (IIA) will function as an Asian transportation hub and as an international gateway to South Korea.

Challenge: A project of this size and importance inevitably has to satisfy not only functional but also symbolic demands. As the final link between the passenger terminal and the off-airport multi-modal access system it will play a critical role in achieving a reasonable access time between downtown Seoul and the IIA.

Solution: Seen together, the Apron Control Tower and the roof of the Great Hall are symbolic of a bird in flight. In this respect it is not only the latest in an architectural tradition begun by Eero Saarinen at New York's Kennedy Airport but also a traditional symbol of good luck in Korea. (Concept design by Terry Farrell and Partners.)

Date: 2000



Above and right *Two views showing how the different architects' buildings work together as a single complex*

Hannam Cultural Complex

Brief: Seoul's vast sprawl is punctuated by a series of districts deriving their character from markets or bazaars. Itewon, the historic foreign shopping district, has recently shed its image as a row of night clubs catering for the nearby US military base and is now a place of cultural interchange for the international community. The project is planned as a new community centre comprising health clinic, museums, research centre, sports and commercial buildings.

Challenge: The client, chairman of a large Korean-based international corporation, believes that the private sector must actively participate in the community to remedy urban problems. The group of buildings should make both an architectural and a social contribution to the public realm.

Solution: Samoo's role in this project is both as client representative and associate architects. An international search was conducted from which four leading architects were selected to participate in the project: Mario Botta (Museum for Korean Art & Craft); Jean Nouvel (Museum for Temporary Exhibitions and International Community Centre); Rem Koolhaas/OMA (Centre for Social Studies & Research and Physical Education Centre); Terry Farrell & Partners (Clinic and museum store). This is the first project of its kind in Asia. At the client's behest, the composition will be experienced as a whole, not just as a collection of buildings. The nature of the programme and the limited size of the site has required the designers to collaborate explicitly in service areas where common areas overlap.

Date: 2000

Above *Model view shows the oval atrium "hinge" at the angle between the research tower and dormitory block.* ***Below*** *Front elevation.* ***Bottom*** *Right side elevation*

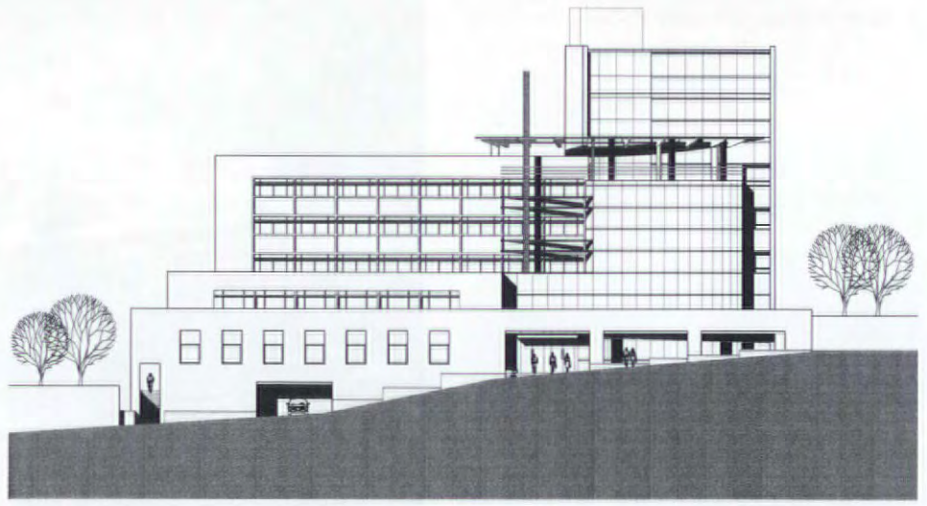
Shilla Institute

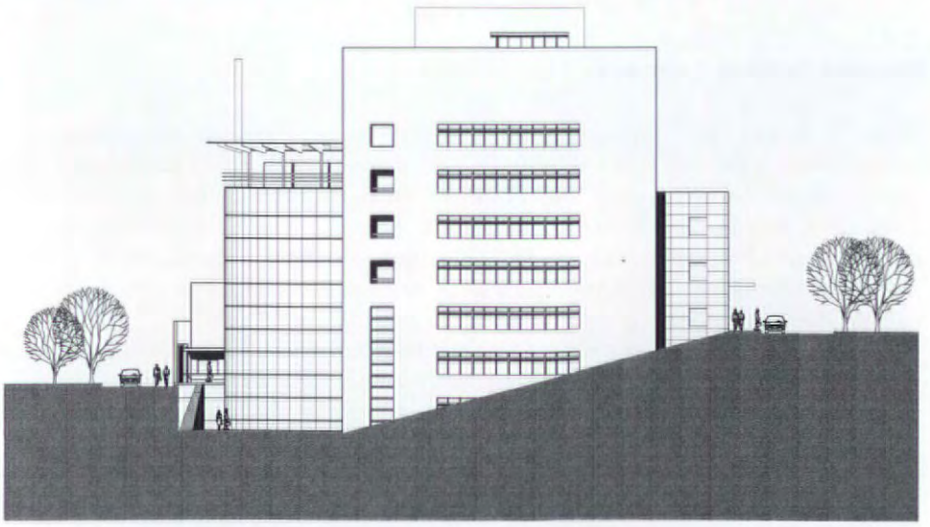
Brief: Hotel Shilla is one of Seoul's most luxurious and prestigious hotels. The Institute will be a research and training facility for staff, part of a long-term strategy to enhance the hotel's competitiveness.

Challenge: The site lies in a residential neighbourhood bordered to the south-west by a line of five-storey commercial buildings. The project had to create a sensitive relationship between the project and its surroundings.

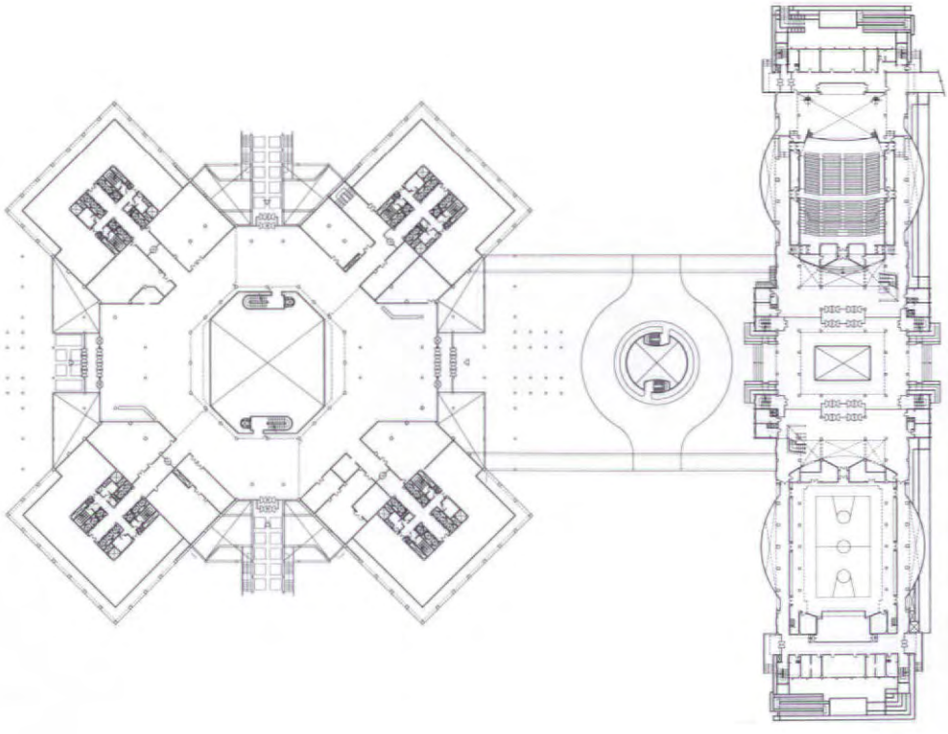
Solution: The project comprises two parts: a seven-storey tower housing the research component and a small 24-room dormitory block facing south. The L-shaped plan follows the shape of the parcel with an oval atrium placed at the "hinge". This atrium provides an interior focal point for the Institute, which treats its neighbours' privacy as carefully as its own. Glazing is concentrated in the elevation that looks toward the commercial block, with limited openings on other facades. The building's bulk is reduced by creating a contrast between planes and volumes. A further scaling device is provided by a low wall element referring to the brick walls that typically separate properties from the street in this neighbourhood. The subtle rotation of the wall enlivens the pedestrian experience and allows a more generous entrance into the garage from the narrow six-metre-wide street.

Date: 1999





Above *Each tower houses a different ministry accessed from a common entrance podium.* ***Below*** *Ground floor plan*



Government Building Complex

Brief: Congestion in Seoul has made it necessary to disperse government services outside the capital city. This complex is the third to be relocated to Taean, and accommodates four government ministries in a suburban location.

Challenge: Full security had to be provided while retaining the benefits of openness to the public. Ease of orientation was also important due to the large numbers of people visiting from all over the country.

Solution: Samoo carried out a comprehensive study programme to define the most rational distribution for a number of ministries that had to be accommodated in the Complex. Their scheme takes the form of four 20-storey towers on a shared glazed podium. This solution functions on three cultural and pragmatic levels: symbolic, in the form of a temple gate with four guardian Buddhas; psychological, breaking the complex down into the four government ministries to provide a sense of identity and easier orientation; and environmental, allowing greater use to be made of natural lighting. Accessibility is a consistent theme throughout the design, with multiple entries and a double-height glazed podium experienced by the visitor as a light-filled open hall with a five-storey cylindrical atrium at its centre.

Date: 1997

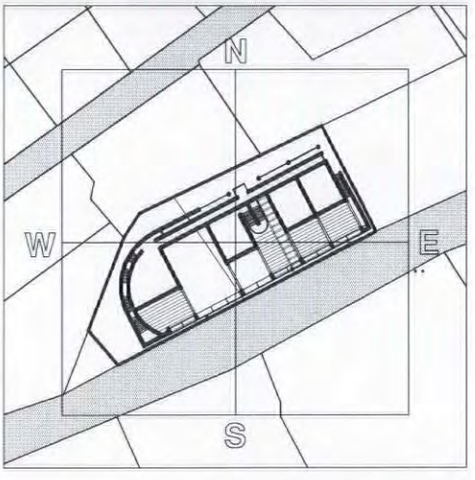
Row House Apartments

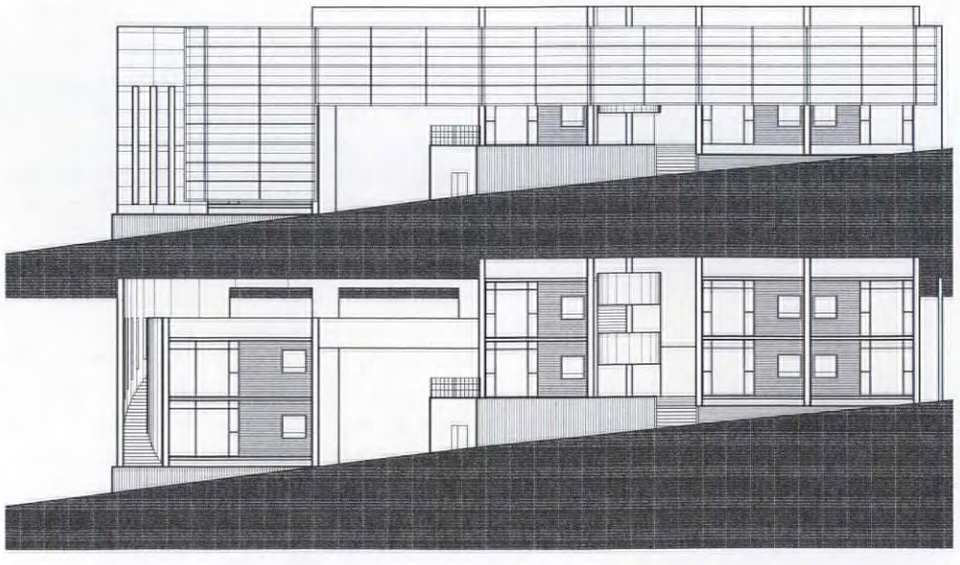
Brief: Nine apartment houses in an exclusive residential neighbourhood in which most houses are surrounded by high exterior walls.

Challenge: In Seoul this building type is associated with a number of characteristic problems, amongst them oppressively high enclosures, insufficient parking space, low-quality materials and poor construction techniques.

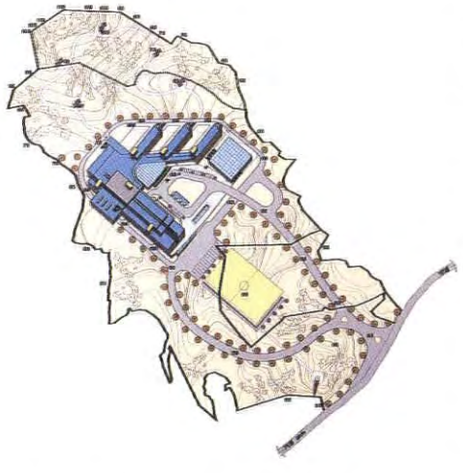
Solution: The project demonstrates a marked preoccupation with the Korean concept of *jeugmulseong*, or *Sachlichkeit* of materials. A semi-transparent glass wall screens the dwellings from the street, replacing the conventional yard wall. As a result, the area behind it is opened up and the silhouettes of the building form projected upon it effectively create another facade at a different level. The buildings are finished in exposed concrete – a technique that remains rare in Korea – and the aim of the design is to achieve an architecture of simplicity that arises from the inherent qualities of the materials.

Date: 1997





Top *A semi-transparent wall protects the apartment block from the street creating a richly textured, three-dimensional facade.* ***Above*** *Site plan.* ***Left*** *Front elevation and section*



Top *Model view from north.* ***Above*** *Site plan.*
Below *Front elevation*

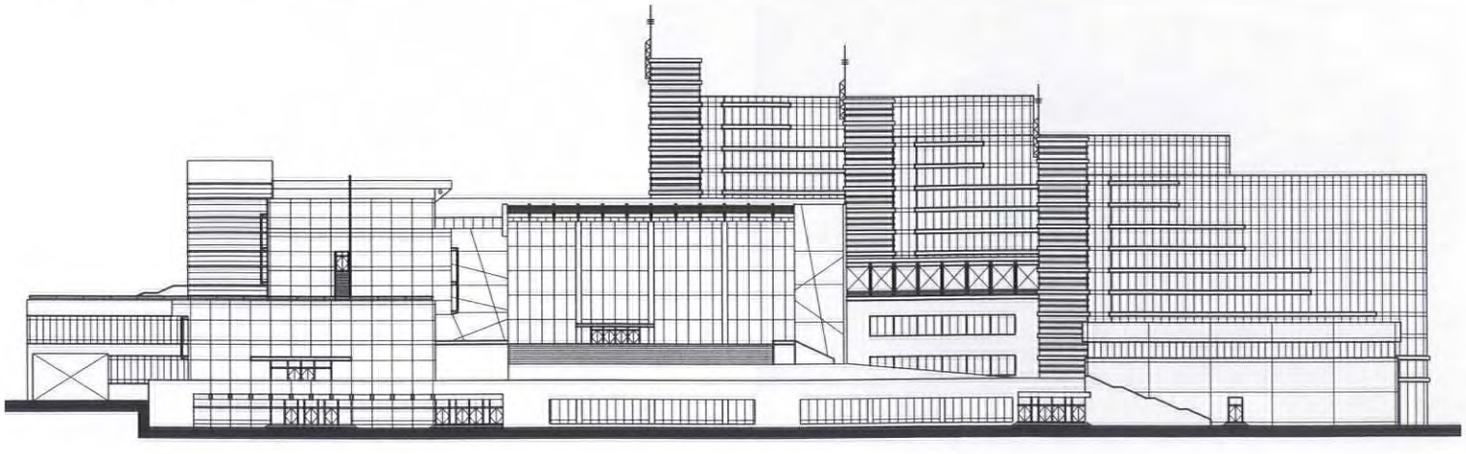
Research Institute

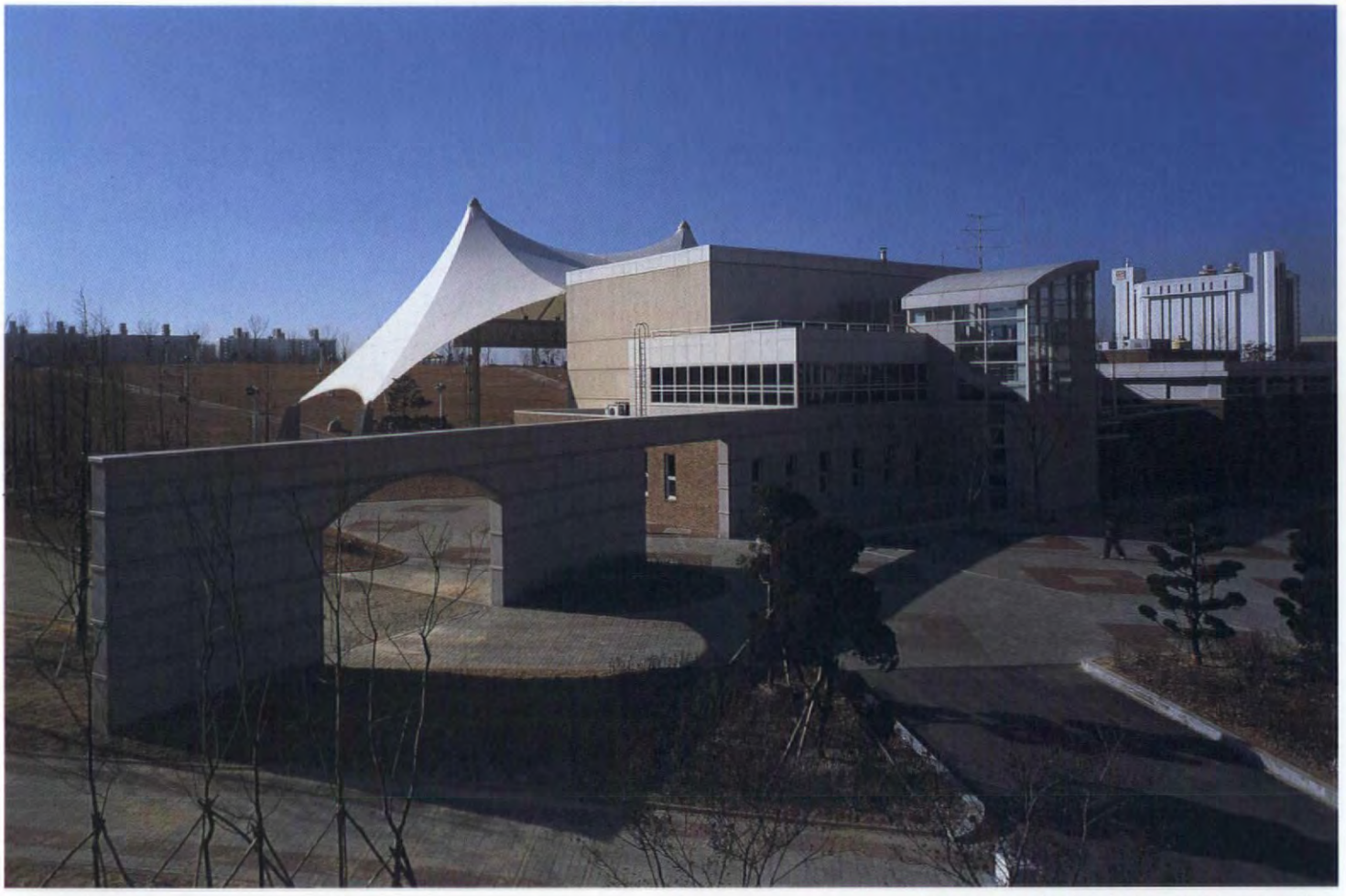
Brief: New training and research facility for Samsung Electronics to replace existing undersized facility.

Challenge: The centre was required to serve a diverse corporate community and to unify the client's growing international operations. Echoing Samsung's corporate maxim of "Smart and Soft", early in the design process the team decided that the training centre should integrate gently with the terrain.

Solution: The building takes the form of a cluster of low profile structures surrounding a central courtyard. Flanked by the educational wing and dormitories, this common space affords views of the city. Along with the athletic grounds, forecourt and view of the site's mountain peak, it forms one of a series of "exterior events" within the site. Internally, flexibility is provided by adaptable seminar rooms and dormitories designed for daytime use, with southern aspects and exceptional views of the mountain side. Every unit has personal computer and telecommunication links to allow individual study.

Date: 1999





Above *The curved wall and entrance to the pavilion echo ancient local building types.* ***Below left*** *Model view showing lawn capable of seating 10,000.* ***Below right*** *Site plan*

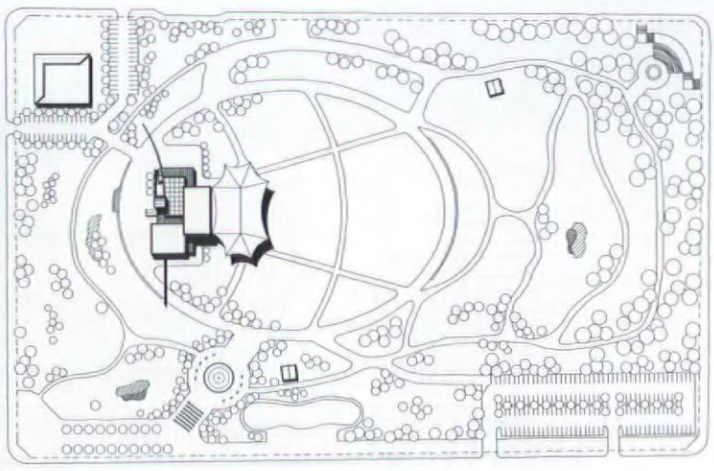
Outdoor Music Pavilion

Brief: A gift to the city of Suwon by Samsung Electronics, the brief specified that the Pavilion should accommodate musical performances and other cultural events.

Challenge: The Pavilion had to combine a suitable image for a advanced technology corporation with respect for the district's unique cultural traditions.

Solution: The model for the cultural component was ancient Suwon castle, in particular its curving stone fortifications. A curved wall and gateway mark the entrance into the performance area. Once inside, the audience can find their seats beneath the tensile roof structure or move out to the sloping lawn (there is space for 1,100 beneath the roof and 10,000 more on the lawn). The upward slope of the PTFE-coated glass fibre membrane roof is a modern interpretation of the inflection of the traditional Korean roof – the natural curve traced by a piece of string held loosely between two points. The membrane also serves as a symbol of the donor in its advanced construction technique and resemblance to an exhibition pavilion. Exterior of the back-of-house envelope is of aluminium and EIFS (Dryvit) panels.

Date: 1995



Tongyang SHL Headquarters Building

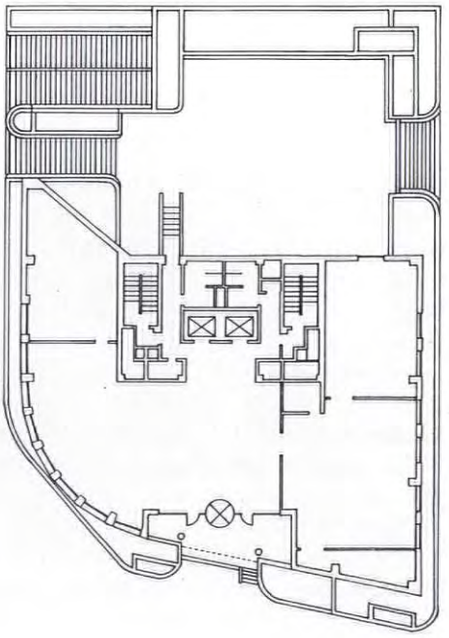
Brief: Nine-storey building to house the headquarters of a securities firm.

Challenge: Height restrictions on the site were a determining influence on the profile of the building, which it was hoped would express the company's extensive use of advanced computer networks.

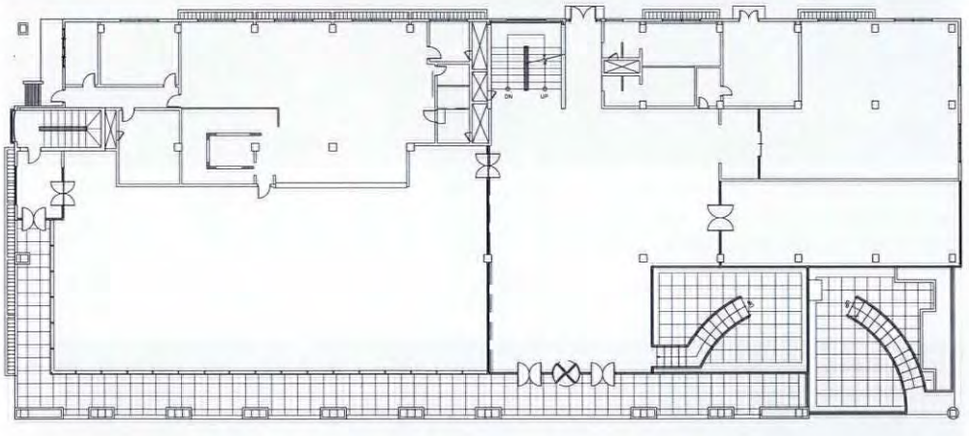
Solution: The building relies on a simple and bold occupation of the corner. Further design development focused on the curtain wall, which is conceived as two planes superimposed. The recessed plane is glazed and window proportions calculated to maximise the openings, while the surface plane is a metal panel system stretched over the curving glass curtain wall with reveals between the panels articulated for emphasis. The metal surface extends beyond the glass to terminate in solid corners and local height ordinances resulted in a stepped profile. The gridded facade is reinforced by the design of the entrance lobby in black and white marble.

Date: 1995

Above *The metal-clad building boldly occupies its corner site.* ***Below*** *The entrance lobby is finished in black and white marble.* ***Below right*** *Ground floor plan*



Above *The Centre acts as an oasis in a harsh industrial environment. The building is clad in corrosion-resistant bronze-coloured aluminium.* ***Right*** *Ground floor plan*



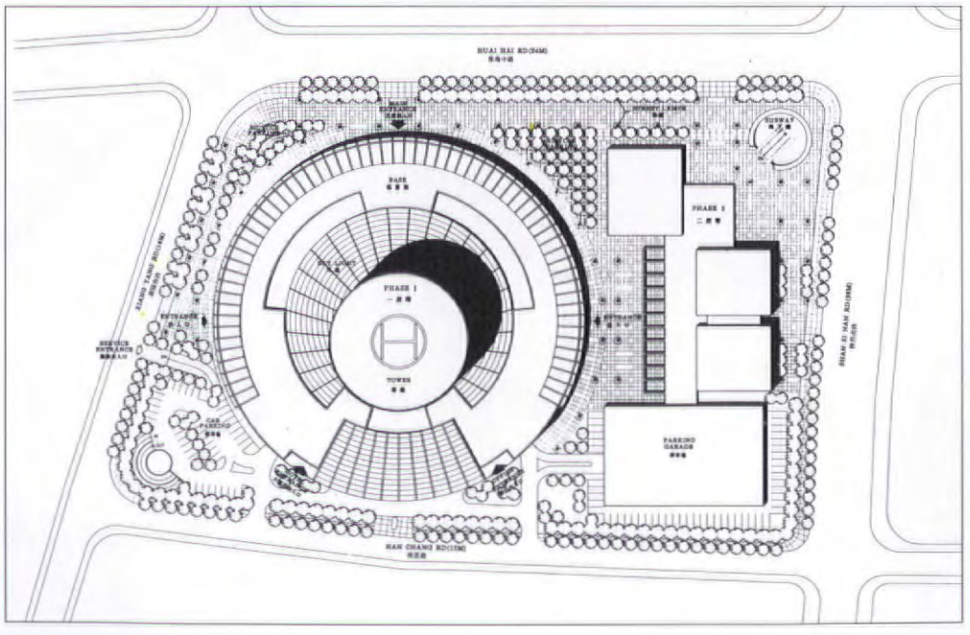
Employee Centre

Brief: Initiated as part of a programme intended to redefine the corporation's public image, a centre was required to provide high-quality facilities for continuing education, leisure and fitness.

Challenge: The site is located in a heavy industrial complex. During the summer months condensation from an adjacent cooling tower produces a shower of water droplets on site.

Solution: The Centre is designed to create an oasis-like setting for the employees. The physical separation between inside and outside that is dictated by the harsh exterior conditions is taken as a design theme. The building is conceived as a rectangular box partially covered with a curved aluminium panel roof. A sandwiched truss system was devised to allow the pipe trusses supporting this roof to extend outside of the skin. Two large glazed openings on the facade give views out to the sea, the only view corridor out from the grey industrial landscape. Shelter from the water droplets is provided by an exterior arcade and a glazed roof projecting over the sunken garden. The entire building is clad in corrosion-resistant bronze-coloured aluminium panels and warm colours are used throughout the interior of the building to increase the oasis-like atmosphere. The hub of the building consists of two grand stairs – one inside, the other outside – drawing people from the whole plant to this symbolic public space. The atrium lobby and sunken garden is articulated as a large room, thus lessening the distinction between the interior and exterior spaces of the building.

Date: 1994



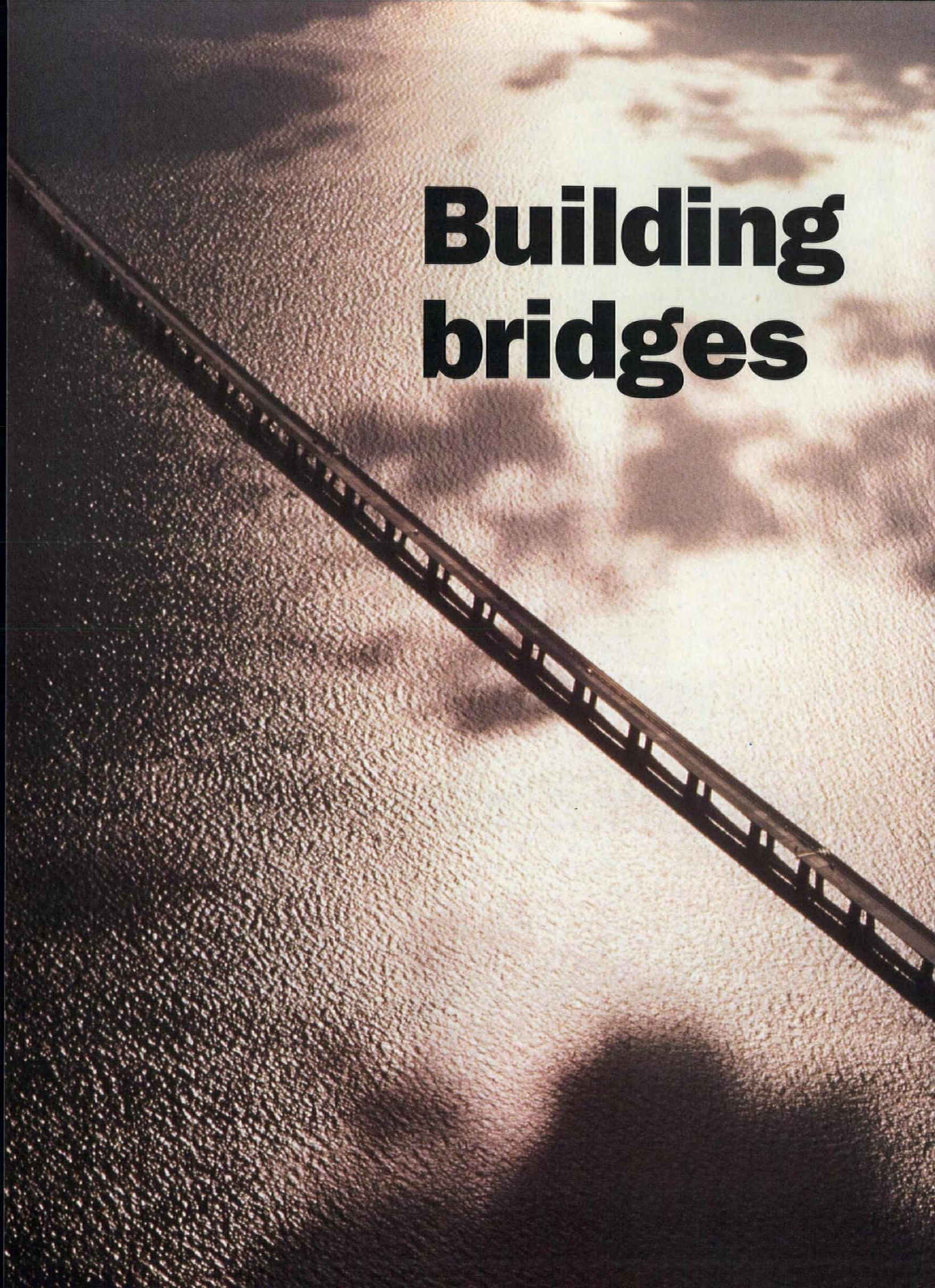
Left *The 72-storey tower containing offices, apartments and 400 hotel rooms is placed within a naturally lit retail "drum".* ***Bottom left*** *Site plan.* ***Bottom right*** *South elevation*

New Shanghai International Centre

Brief: Accommodation to include retail and business functions, restaurants and leisure facilities, offices, 88 office/apartment units and a 400-room hotel.

Challenge: The challenge was to design a landmark tower to mark the transition to the twenty-first century for the "First City in the Far East".

Solution: The designers developed the masterplan in accordance with the Chinese philosophy of harmony between natural spirit and building orientation (*feng shui*). The plan is generated from Chinese characters. Supplementary buildings are sited asymmetrically to emphasise the tower and to form a monumental outdoor plaza. The base of the 72-storey tower slips inside a larger drum, a multi-storey atrium providing ambient natural light for an urban shopping environment.



Building bridges

David J Brown reassesses the skills of engineers and architects within the bridge-building industry, at a time of unprecedented international activity. Many projects are attributed only to the "star" architects and ignore the engineers; others in the past have neglected to mention the architects at all. At last, in some countries at least, the balance has been redressed. David J Brown is author of *Bridges: Three Thousand Years of Defying Nature* (Mitchell Beazley, UK)

Antonio da Ponte, designer of the supreme masterpiece, Venice's Rialto Bridge, is usually described as an architect. But as far as we know he was also responsible for the brilliant engineering of the foundations, so what's in a name, if you are a 75 year-old Renaissance Man? Rigid division between the two disciplines is largely a nineteenth century invention, and its down-side, the assumption that engineers are ignorant of aesthetics and architects careless of practicalities, has haunted what the US neatly terms A/E (architect/engineer) ever since.

The Rialto was one of several minatures exhibited in the travelling exhibition *Living Bridges* (see below) which focuses on bridges from the Middle Ages to the present day. Each model was a of a perfection that reawakened lost memories of junior bricklayer heaven in even the stoniest adult heart.

Bridges from France to the UK

Bridges have hit public awareness. That two national arts establishments should each commit several hundred square metres of sought-after exhibition space to *Living Bridges* – first shown at the Centre Pompidou in Paris and subsequently at the Royal Academy of Arts (RA) in London – says something about a new level of public interest in what not so long ago would have been thought the preoccupation of old-fashioned schoolboys.

Living Bridges are not just bridges, being by definition inhabited – or intended to be; many of the proposals exhibited remained unbuilt. This not only expands concepts of what bridges can be for, but focuses on by whom, and how, they are designed: a monk is thought to have conceived the exhibition's most venerable bridge, Old London Bridge – which spent the next 600 years trying to deny passage to the River Thames.

Alongside the exhibition's "river of time" plenty was to be heard about the appropriateness of this or that structure for its real-life intended setting, comments largely aimed at the most recent projects in the exhibition, the seven short-listed entrants in the RA's competition for a new inhabited bridge across London's River Thames between Waterloo and Blackfriars Bridges. Architects led the design teams for these, and if you regard them as essentially buildings which happen to be over water – where what is carried by the structure is more important than that structure's action – this seems right and proper. So no matter, perhaps, that the predominant view of these designs seemed to be that they were grotesque and self-indulgent. (The exception was Ian Ritchie Architect's landscaped design, based

"In the end bridges stand or fall – literally – because of their engineering"

simply and effectively around a huge perforated beam. It didn't win.)

But what about the bridge *qua* bridge, intended purely to allow A to get from B to C across D? Architects can, and do, have a role here. Artists get involved in bridges too, on occasion. The Venetian sculptor Luciano Vistosi has designed a 35-metre-span arch bridge to span Venice's Arsenale Canal, in glass, and

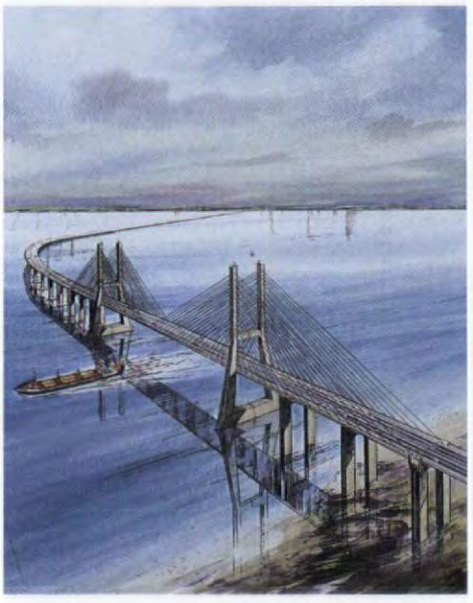
the city council plus a wealthy American philanthropist named James Sherwood, are said to be ready to back it. The glass blocks will be strengthened with reinforcement, made not from metal but carbon fibre. And each step will be lit by "optic fibres" at night. Only the artist's name, though, has appeared in publicity distributed outside Italy. Shouldn't the creative contribution of engineers responsible for "added value" appear also?

Engineers – unsung heroes?

Other new materials advances with particular relevance for bridge design – use of higher strength steels, lighter metals like aluminium, improved concrete, and fibre-reinforced composites – all have aesthetic implications for shape, colour and texture. One of the most exciting and optimistic trends of late twentieth century design, and not just for bridges or even construction generally, is the growing cross-fertilisation of knowledge and understanding between arts and technological disciplines. What is of concern is that this process brings with it an equally mutual acknowledgement and respect. In the end bridges stand or fall – literally – because of their engineering. One has to search hard in the publicity accorded Foster & Partners' winning design for the vast Millau Viaduct in southern France (see *WA*50 October) for a mention of the engineers, Sogerleg et al, and yet the Foster project director Tim Quick has been quoted as saying that the structure is "very much engineering-generated" and "the result of collaboration with a good set of engineers". That sounds an honourable and an honest statement, and leads to further speculation. Is the prominence currently being accorded to architects in the world of bridge design the symbiotic result of media fixation with "stars", and the fact that star architects are the most skilled at manipulating it? Or is it because they have a strength of vision and sheer entrepreneurial push that engineers can't match?

Another Thames bridge competition, recently won by Foster and Partners (again) and sculptor Sir Anthony Caro is for a footbridge linking Bankside Power Station and St Paul's Cathedral, London. The stability of such a long-span, slender structure must depend on skilful engineering – by Arup's – but it is the two knights who have stolen the headlines.

Media coverage during the summer of 1996 about Paris's new Pont Charles-de-Gaulle – an elegant aerofoil deck on slender splayed supporting fingers – got around to mentioning "the bridge's architect" in the penultimate paragraph. Engineering? What engineering? Perhaps a slow pendulum is swinging. More than 60 years ago something of the sort happened in reverse with the most famous long-span suspension bridge of all, San Francisco's Golden Gate. Long trumpeted as essentially the brain-child of engineer Joseph Strauss, much of its distinctive



character – the unique Art Deco profile of the towers and the characteristic red-lead colouring – was stemmed from a gifted architect named Irving Morrow, who never seems to have been acknowledged for his contribution.

Getting it right – in Denmark and Portugal

This kind of architectural role – now, of course, acknowledged – continues in the world of bridge design. The 18-kilometre Great Belt Link (Storebælt) between Denmark's islands Funen and Zealand is the largest single bridge project under construction in the world: its

Opposite page top *The 18-kilometre Vasco da Gama Bridge, across the Tagus River in Portugal by Lusoponte – a company established specifically for the project – is due to open in time for Lisbon's Expo 98.* ***Opposite page bottom left*** *Antoine Grumbach's joint-winning-entry in the Thames Water Habitable Bridge competiton, held in connection with an exhibition at the Royal Academy of Arts, London (1996).* ***Opposite page bottom right*** *Photo-montage of Foster & Partners' proposals for the Millau Viaduct, France – an "engineering-generated" project credited primarily to the architects.* ***Right*** *The Hoga Küsten Bridge, over the Ångerman River, Sweden. The Swedish National Road Administration provided project management services for the 1210-metre development. Consultant architects Ahlgren Edblom paid particular attention to the shape of the pylons in recognition of the site's natural beauty*

key feature is the 1624-metre suspension bridge that forms the central element of the roadway-carrying East Bridge. (There are twin road and rail box-girder beam West Bridges leading to a small island roughly mid-way, from which the rail line dives down into the already-completed West Tunnel). To quote from one of the forthcoming technical volumes on the whole project: "It was vital to the success of the design process that an excellent rapport and working relationship be established between the engineers and architects early in the project. This close collaboration and common desire for an overall aesthetic quality and harmonious relation between all constituent components made it possible to achieve such a high degree of design integrity and overall homogeneity in the total project. In the designs for the concrete pylons, it was the aesthetic intention that all surfaces should seem to flow smoothly and continuously from one into another, with the clean, simple lines creating a purely abstract and scaleless quality that serves to emphasise the dramatic impact of their great height." These pylons are already towering their full 254-metre height out of the Great Belt's waters, a tribute to this fruitful collaboration between the engineers of COWI consult and architects Dissing+Weitling and J Vesterholt. The link will be completed in 1998.

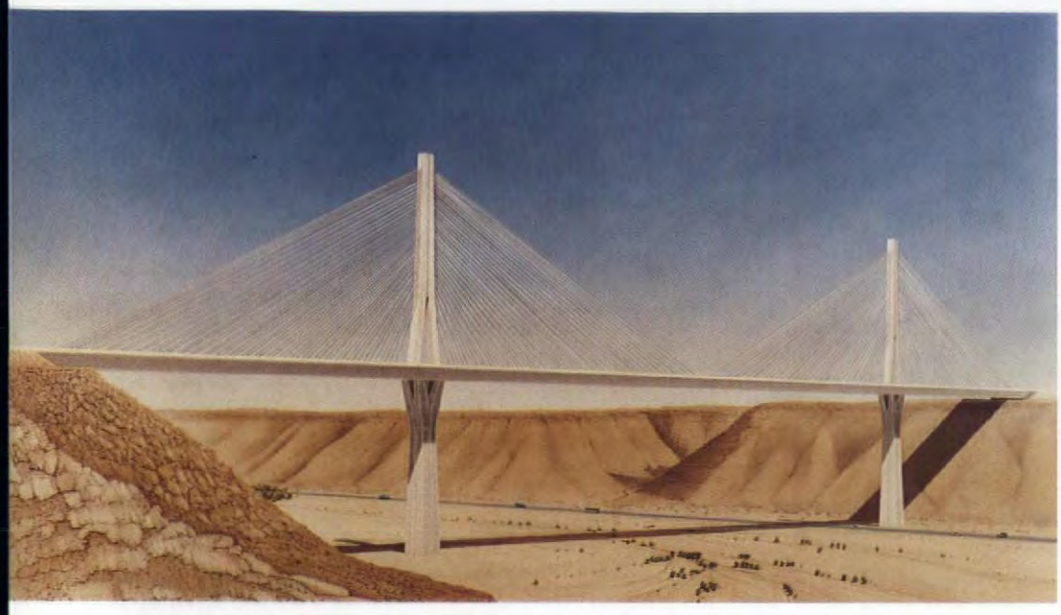
The Vasco da Gama Bridge across Portugal's Tagus River (also 18 kilometres long and due to open in time for Lisbon's Expo 98), and the 15-kilometre Øresund Link between Denmark and Sweden, both consist of long approach viaducts plus large cable-stayed central spans – at 420 metres and 490 metres respectively neither require the extremes of navigational leeway that have necessitated Storebælt's record-breaking East Bridge. And both have comparable aesthetic inputs from architects. The Vasco da Gama Bridge will carry only road traffic, but Øresund, like Storebælt, is catering for both road and rail. Unlike Storebælt, however, both will run throughout the length of the bridge, a special challenge over a long cable-stayed span to engineering designers Ove Arup & Partners (plus architect Georg Rotne) of the ASO Group.

Building the world's record-breakers

On all these projects the main spans are just the most spectacular among several elements, but elsewhere in Europe, notably Scandinavia, other single bridges almost rival them in scale. Only recently was the Skarnsundet Bridge across Norway's Trondheimsfjord supplanted as the world's longest cable-stayed span by France's Pont de Normandie, and currently under construction across Sweden's Ångerman River is the Hoga Küsten Bridge, at 1210 metres the world's seventh-longest suspended span. Here, because of the beautiful surrounding landscape, special attention has been paid to the aesthetics of the shape of the pylons and cable anchorages, by consultant architects Ahlgren Edblom.

South-east across Europe, Italy and Greece may soon see the start of work on two long-mooted projects, for neither of which has any architectural involvement yet been credited. After plans for record-breaking single spans came and went, the 2.9-kilometre Gulf of Corinth dividing the Grecian mainland from the southern Peloponnese Peninsula, looks set to be crossed by what will effectively be two 560-metre-span cable-stayed bridges linked together so that a third 560-metre-span is formed in the centre; with the two 305-metre-side-spans, the whole will add up to the world's longest continuous cable-stayed structure, and in an area of significant seismic activity. Summer 1996 also saw Italian governmental movement begin again towards the fruition of an even longer-held pontist's dream, almost exactly due west from the Gulf of Corinth: the Messina Strait – a similar distance, comparably earthquake-prone, but because of water depth, inescapably single-span. If the suspension bridge that has been planned in detail since 1992 by the Italian state consortium

"Is the prominence currently being afforded to architects [not engineers] the symbiotic result of media fixation with 'stars'?"



Left *Projected view of the Wadi Leban Bridge, near Riyadh, Saudi Arabia engineered and designed by Dar Al-Handasah. The immense depth (165 metres) of the Wadi requires the roadway to be located halfway up the bridge's two towers, resulting in a "mirrored splay in the towers giving a striking vertical symmetry.* ***Above*** *Detail of one of the two towers of the Wadi Leban Bridge during construction*

Stretto di Messina is finally built, it will redefine the limits of the possible in tower height (376 metres), deck breadth (80 metres) and above all length of span. At 3.3 kilometres it is difficult to imagine it ever being surpassed.

No long-span record-breaker, but still one of the most arrestingly beautiful large cable-stayed bridges, is under construction across Wadi Leban near Riyadh in Saudi Arabia. What appears above the deck of cable-stayed bridges usually forms the main visual interest, but here the Wadi is so deep that the two towers, each more that 165 metres tall, carry the roadway virtually half way up their height. The bridge designer, the engineer Srinivasan of Dar Al-Handasah, has introduced a "mirrored" splay in the towers immediately above and below the deck, giving a striking vertical symmetry.

Making up for lost time in Japan

Large cable-stayed bridges, the form for all but the very longest spans in post-war Europe, are still relative rarities elsewhere. Japan came late to them – but is making up for lost time. In sum, the three links between the islands of Honshu and Shikoku, whose design and construction will have occupied the last quarter of the twentieth century when the last is completed in 1999, dwarf any other bridge project ever, anywhere. Among other structures – trusses, arches, viaducts – the three links include nine suspension and no less than five cable-stayed bridges, and

All-female Japanese bridge-builders

By Astrid Klein

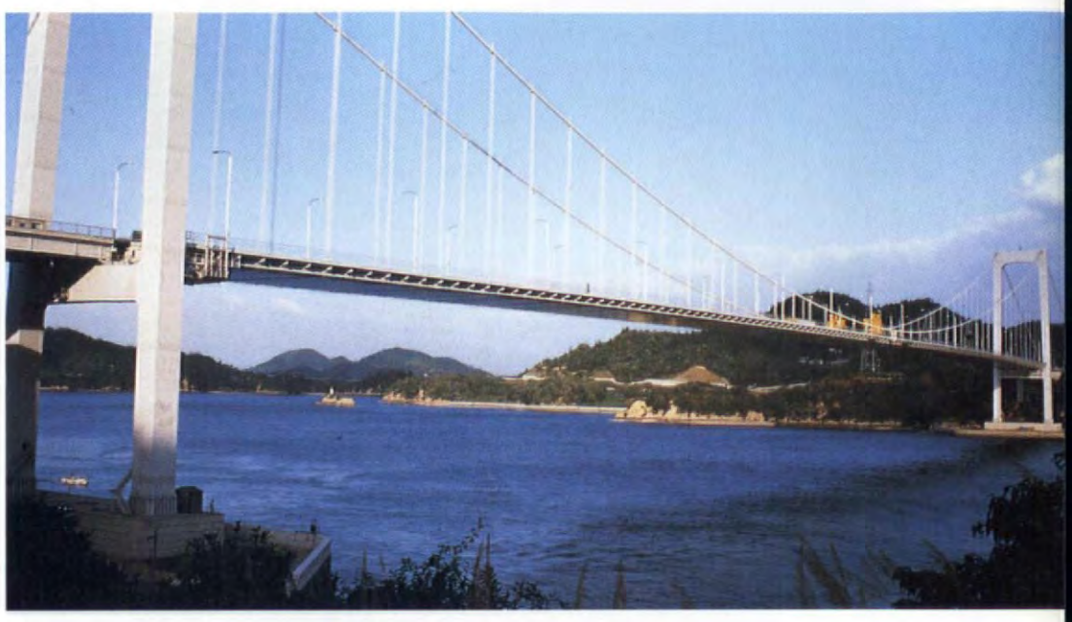
In the very unlikely setting of Japan's long male-dominated civil engineering world Miyoko Ohno thought it was high time to do away with stereotypes. Twenty years ago she decided to establish an all female engineering firm, M + M Design Office. Ever since, she and her team have been designing some of the most elegant bridges in Japan.

Ohno made it her task to break down the notion that bridges only have to be functional. Bridges have a landmark function and become an integral part of the landscape. Where expressway bridges cross a residential area, dwarfing the surrounding buildings, she strongly believes in the importance of a more sensitive approach to bridge design.

M + M Design Office insists that it is involved from the initial planning stage through the myriad of design decisions and tests influencing the smallest details, until the bridge is completed – similar to an architect overseeing his/her project.

For their projects they choose the most appropriate structure, refine it to its bare essentials, challenging advanced technologies and new materials to their limits, until the result becomes a light and aesthetically appealing feature – very much like a sculpture set in a recreational park and beautifully lit at night.

M + M Design Office, best known for their S-shaped "Harp Bridge" (pictured left), have designed innumerable bridges, ranging from tiny foot bridges and pedestrian crossovers to immense expressway projects. Their latest being "Odawara Blueway Bridge" which in its considerate manner so far best represents M + M design principles.



Right *The Ohshima Bridge is one of nine major bridges on the Nishiseto Expressway, Japan. The Expressway – due to be completed in 1999 – is one of three links across Japan's Inland Sea. All three have been administered and overseen by the Honshu-Shikoku Bridge Authority*

already well forward in construction are the world's largest in each category. The main spans of the Akashi-Kaikyo suspension bridge and Tatara cable-stayed bridge will be respectively 22 percent and four percent longer than the Danish East Bridge and the French Pont de Normandie, but like the other Honshu-Shikoku bridges their designs have been resolutely engineering-driven.

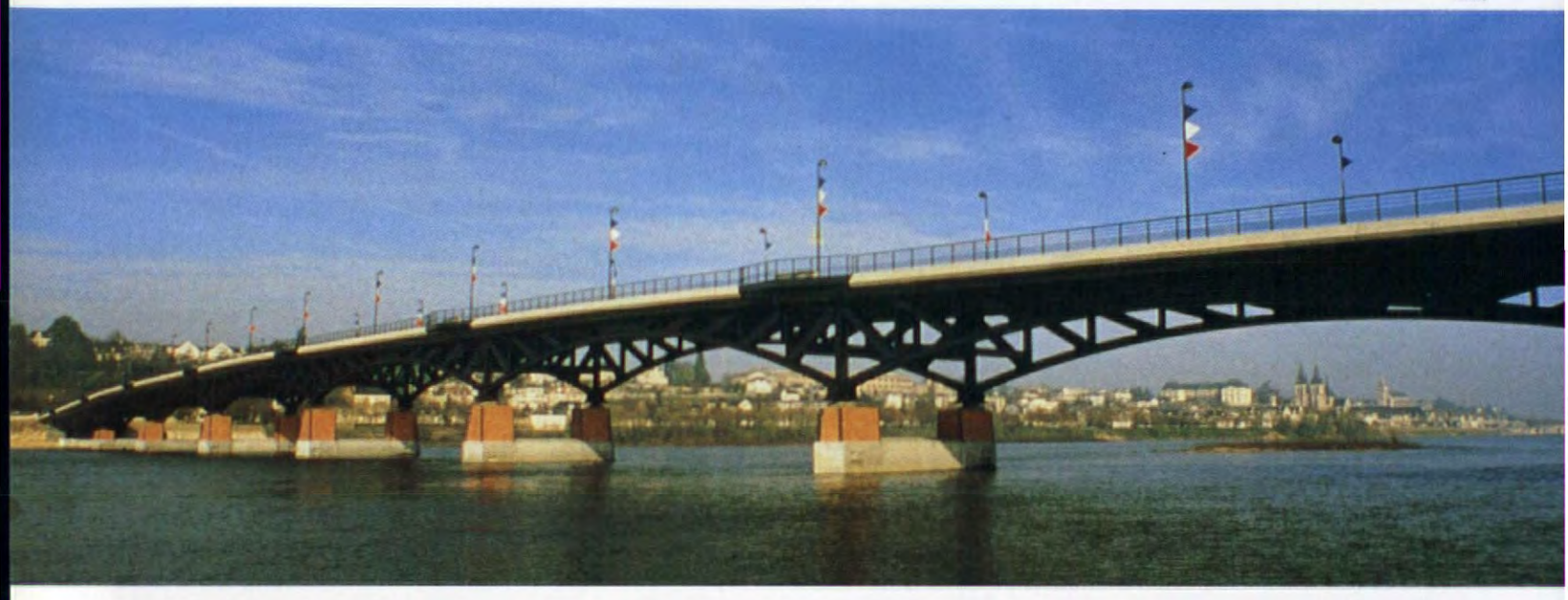
They have their own muscular grandeur, the Akashi-Kaikyo in particular looking far more like an American bridge of the 1950s writ large, than more recent European counterparts. In view of the fact that it crosses the busiest, and one of the fastest-flowing, stretches of water in the world – and has already withstood, without flinching, the 1995 Kobe earthquake only a few kilometres away, aesthetic niceties fall into a different perspective.

Canada – overcoming a hostile environment

Half way around the world, what is perhaps the most heroic of all long bridges currently under construction has no vast suspended span or fine spray of anchoring cables, and certainly no obvious architectural involvement – be it merely prettifying or more thoroughly conceptual. This is the 12.9-kilometre Northumberland Strait Crossing: 43 cantilevered spans, each 250 mètres long, linking Nova Scotia and Prince Edward Island, and supported on vast precast concrete piers sunk to the seabed and enclosed by conical concrete shields to withstand impact from icebergs. (See Project review). It must surely be one of the most hostile environments in which any major bridge has ever been founded, and one can little doubt that any thoughts about the structure itself in the minds of Canadian motorists driving out over the crunching floes through sub-Arctic winds will concentrate on hopes that the engineers have done their work well. **WA**

Left *Chris Wilkinson Architects' competition entry for the New Tyne Bridge, Newcastle, UK: its "lightness" is intended to contrast with the mass of the soon to be developed Baltic Flour Mill which is on the southern side of the river. The competition is just one of many worldwide timed to coincide with the creation of landmarks for the Millennium*

Face to face



Houdry

A bridge is not a beam

Graham Vickers talks to Alain Spielmann, an architect whose substantial body of work over the past 20 years consists mainly of bridges. Although he has designed a number of small houses, and the prize-winning Dhoby Ghaut station in Singapore City, bridges have preoccupied him, and his native France has supplied him with an enviable landscape, a culturally-sensitive central government, benign local councils and a grateful public. Spielmann's bridges are not just functional, they are popular, and are visited by people who have no need to use them. Portrait by Paul Raftery.

At his Paris office I ask Alain Spielmann to nominate an all-time favourite bridge. "The last one I designed!" comes the answer, suggesting a degree of self-obsession that proves unfounded. Spielmann is in fact the exact opposite of the egocentric architect. He became interested in bridges not as grand personal statements but for the kind of architectural opportunities they enshrined.

"When I began as a young architect I was very unhappy to be asked to work on massive residential buildings" he says. "I simply did not think that it was my profession to do that".

He had studied first at the architectural department of an engineering school in his native Strasbourg, then at L'Ecole des Beaux Arts in Paris. It was an education that left him with strong classical leanings.

Rejecting work on mass housing projects, the newly-graduated Spielmann instead joined the office of an established architect in Paris.

"I was lucky. That architect had just finished a bridge in Africa and he immediately put me in charge of another bridge project. I was only 24 but I was well-prepared because I had studied engineering and I was good at visualising things in space and understanding structural processes."

Spielmann suggests that in France at the time – the 1970s – there was a clear division between architects and engineers that resulted in a rather formal approach to bridge design.

"Architects saw engineers as people who could only work with figures, and engineers saw architects as people without technical competence who were only able to draw" he recalls. "This has changed now, although engineers are still not always able to deal with issues like how a bridge fits into the landscape. Sometimes they will call me for advice."

They are probably calling the right man, for whilst many bridge-building architects are susceptible to grand gestures and high-profile hymns to technological progress, Spielmann's aim is to contextualise the structure rather than make it stand alone. Of the bridges he has not built, he particularly admires three Parisian classics: Ponts Royal and Marie, and the city's oldest, Pont Neuf.

"What I like about all these bridges is the way they fit into the city, the relationship between the structure and the environment" he says.

Spielmann's practice comprises ten people and two of his fellow architects have been with

Opposite page *Alain Spielmann's Blois Bridge, over the River Loire which was named the most beautiful steel construction in France in 1996 by the Syndicat de la Construction Métallique de France.* ***Right*** *Spielmann in his Paris studio with a model of the Strasbourg bridge*

him for 15 years. This is no accident, the value of cumulative experience being reflected both in the workforce and the work.

"Continuity is important to me because we are working from one project to another. The latest bridge has something of all the others in it."

The latest project is the prize-winning bow-string bridge over the Canal de la Marne-au-Rhin at Strasbourg (see Project review, and portrait). This structure neatly illustrates Spielmann's approach.

"Designing a bridge is not just a structural problem, it's a social problem as well" he says. "I don't think there is a direct mechanical way to a solution, and I do not believe that form follows function. There are different approaches, and the sum of those approaches creates something that may not be obvious at the beginning".

In this competition project Spielmann rejected the official guidelines that proposed a conventional solution to spanning the 60 metre canal using columns. Instead he elected to make minimum impact on the environment, removing a couple of trees, placing abutments in front of existing houses and using a bow-string to support what was now a 104 metre span bridge.

"Also we were asked to create an anti-noise wall for pedestrians. I did not like this idea, and instead transformed it into a gallery for the pedestrian."

This arcade-like accretion is popular with the public but does not necessarily please purist engineers.

"'Now you don't see the exact height of the beam' they complain" reports Spielmann with a smile. "But for me a bridge is not a beam."

A bridge is not even a bridge in the early stages, since Spielmann maintains that the construction process can, in some ways, be more important to him than the result.

"I believe that for construction to be successful there must be a good partnership between all people concerned. In a building that involves four partners – architect, engineer, contractor and client – they must all work well together. An important part of my job is to encourage that. Then at all stages of the construction process there is a good feeling. People comment on the good atmosphere."

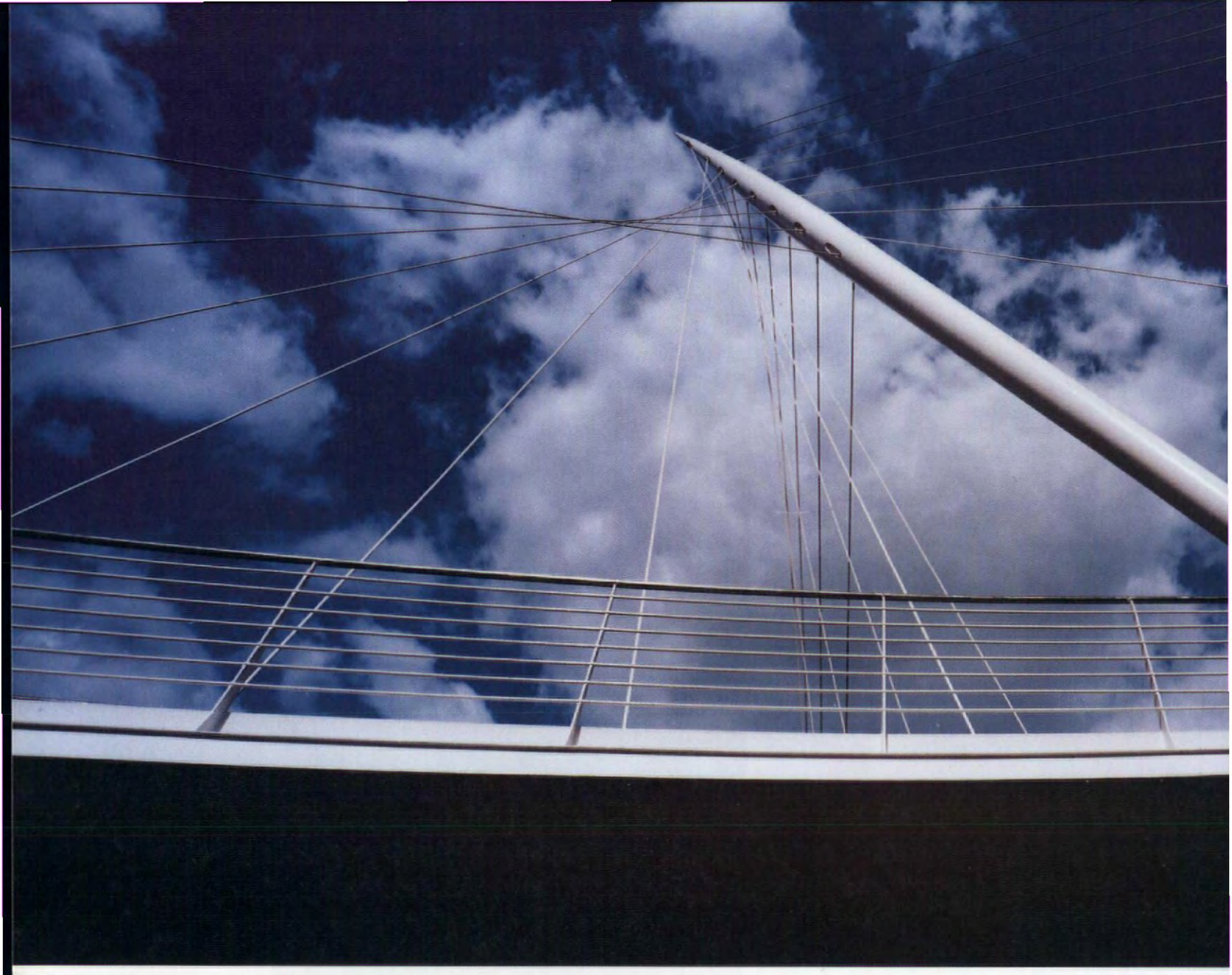
This particular feel-good factor is no affectation. Spielmann brings a genuine touch of romance to bridge building, not in a sentimental way but rather in the spirit of a broader French attitude towards the built environment. Spielmann identifies this spirit as the legacy of a cultural continuum deriving from "Louis XIV, the L'Ecole des Beaux Arts and L'Ecole des Ponts et Chaussées".

"This explains what puzzles many architects from other countries" he says. "It explains why it was possible in France in the 25 years since 1970, to have a renewal of bridge building."

Spielmann shuns publicity, claiming to have had no time for self-promotion and he actively avoids "expressing himself" in his structures.

He concludes with one of the little paradoxes that he says have attended his life: "At Strasbourg, in forgetting my ego and finding a useful solution with the covered walkway, people are coming to see it. The mayor opened it, using words like chef-d'oeuvre. So the paradox is you do your job, trying to avoid anything ostentatious... and people still celebrate it." **WA**

"The paradox is you do your job, trying to avoid anything ostentatious... and people still celebrate it"



Trinity Bridge

Salford/Manchester, UK

Architect: Santiago Calatrava
Photography: John Donat

Trinity Bridge links the Chapel Wharf area of Salford to the edge of Manchester's business district. The two cities are separated by the 36-metre wide River Irwell. The asymmetric inclined single-mast cable stay bridge is intended to be a confidence-inspiring symbol in a run down urban area. It signifies the first completed stage of an ambitious plan to reintegrate 40,000 square metres of Chapel Town into the wider urban fabric.

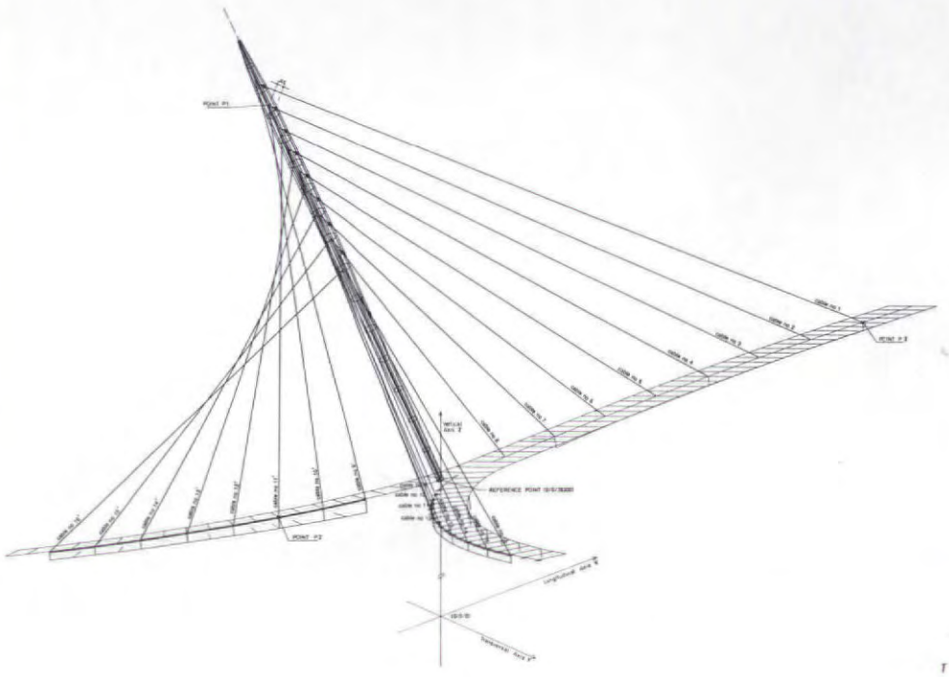
The bridge is the brain-child of Roger Rees, former Chief Executive of Salford City Council. It was he who invited the Spaniard, Santiago Calatrava to put forward some plans whilst the architect was visiting Manchester in the late eighties.

In form, Trinity Bridge represents a significant departure for Calatrava. The bulbous, curved tube forms of Lyon Airport Railway Station and the Kuwaiti Pavilion of Expo 92 have been replaced by a monumental, almost construtivist , sculptural elegance, with the emphasis on visual tension and light-weight materials.

The 41-metre-high cigar-shaped pylon of the bridge is rooted on the Salford side of the river, symbolically stating the city's guiding influence in seeing the project come to fruition. The main span of the bridge, from the Manchester bank to the top of the pylon, measures 54 metres. The bridge is 67 metres long, the minimum width at the Manchester end is six metres, with a corresponding figure of 11 on the Salford side.

A striking feature of the design is the

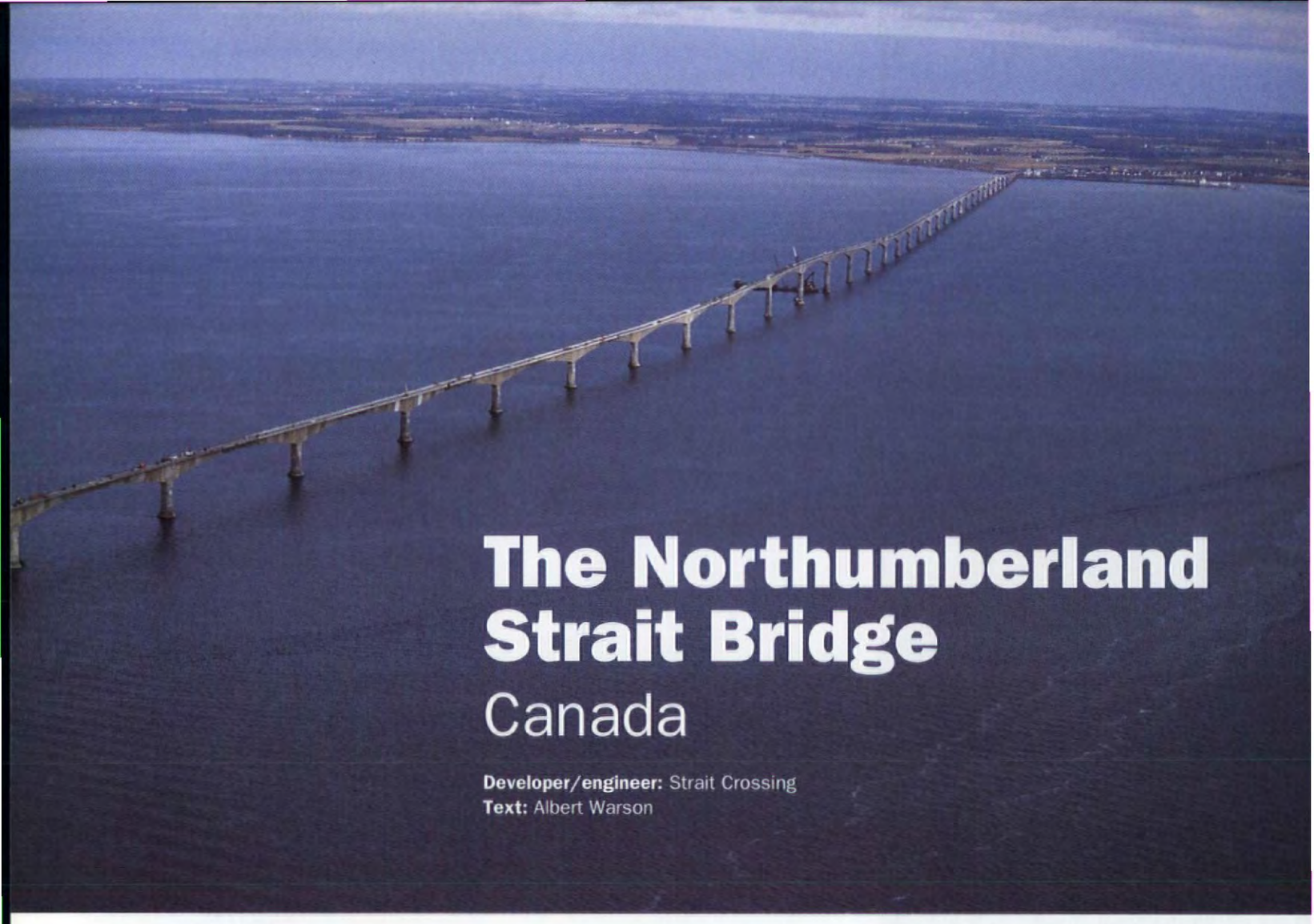
Left *View of 41-metre, cigar-shaped pylon.* ***Below*** *Axonometric.* ***Bottom*** *Lighting plays an important role in the overall design concept. Bulkhead lamps are built into the cable anchorage housing along the centre of the main deck*



anchorage of the cables within apertures formed in the side of the pylon. This required absolute accuracy in the manufacturing process since the anchorages had to be welded into their cone sections, on the bridge deck, at precise angles before the sections could be welded together to form the pylon.

Lighting plays an important role in the overall design concept. Four spotlights are fixed within the box girders, illuminating the walkway and steps below the bridge. Further deck-level lamps are incorporated within the parapets of the curved ramps, and bulkhead lamps are built into the cable anchorage housing along the centre of the main deck span. **WA**

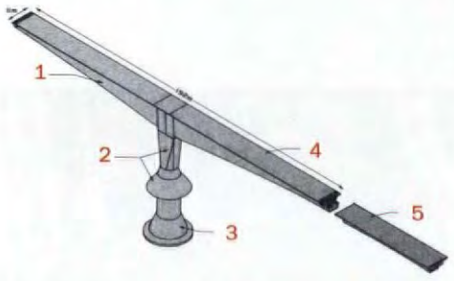
Project	Trinity Bridge, Salford
Client	Salford City Council
Architect	Santiago Calatrava
Engineers	Salford City Council
Contractors	DEW Group



The Northumberland Strait Bridge

Canada

Developer/engineer: Strait Crossing
Text: Albert Warson



Key

1 Main girder
2 Pier shaft & ice shield
3 Pier base foundation
4 Main girder
5 Drop-in span

Prince Edward Island (PEI) became a province of Canada in 1873. At the same time PEI was given federal government assurance, enshrined in the country's constitution, of perpetual "efficient steam service" to the mainland.

"In perpetuity" turned out to be until 1 June 1997. That is when the government's subsidised ferry service linking tiny PEI (5,657 square kilometres, 135,000 population) to the mainland province of New Brunswick, will be replaced by a 12.9 kilometre-long bridge across the Northumberland Strait.

The C$840 million Confederation Bridge – amongst the world's four longest bridges and more than five times as long as the San Francisco Bay Bridge – was designed by the international Strait Crossing Development Inc consortium, based in Charlottetown, PEI's capital. The consortium is made up of SCI Contractors Inc, Calgary, GTMI (Canada) Inc, Montreal, a subsidiary of GTM Entrepose, France and Ballast Nedham Ltd, a Dutch company. The two-lane toll bridge will revert to Crown ownership in 2032.

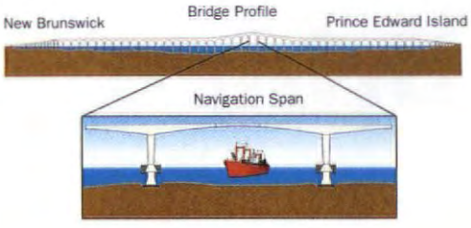
It is billed as the "world's longest continuous marine span bridge" – the Great Belt Link, (Denmark) is longer, but is separated by an island. The 44 steel-reinforced, 250-metre-long spans, and 183 main bridge components, each weighing up to 8,200 tonnes, were hoisted into place by a 9,000 tonne ocean-going marine crane. "Approach bridges" – part of the structure at the shallowest points on either end, account for another 1,880 metres.

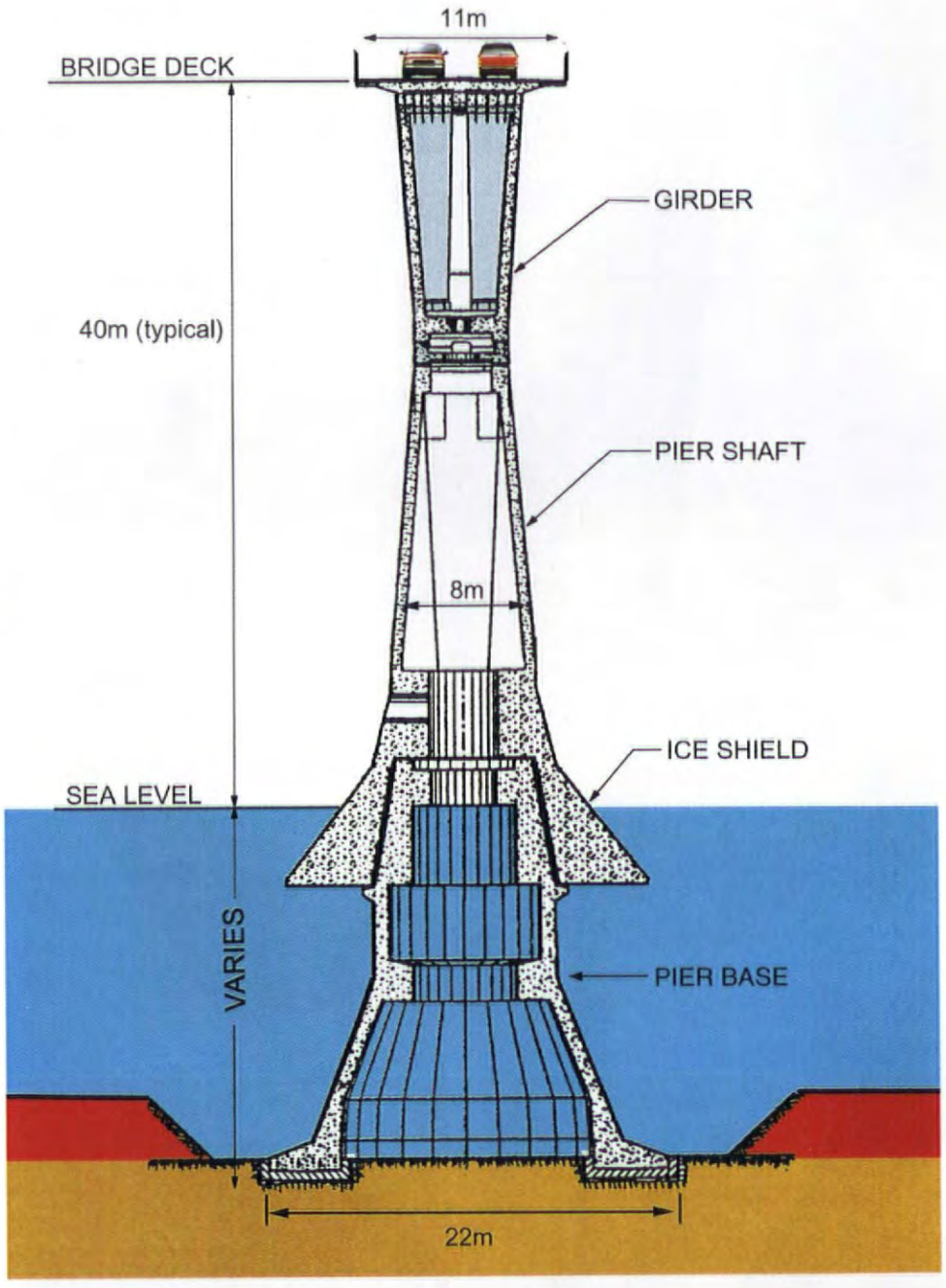
Work started late in 1993, from staging facilities that pre-cast pier bases and shafts, main girders and drop-in spans – more than 80 percent of the work was in fact done on land. A typical frame of the bridge consists of a pair of 190 metre double-cantilever main girders fixed to rectangular piers supported on conical pier bases set on the strait's bedrock. Frames are completed with 60 metre drop-in girders; every second span is fitted with a single expansion joint.

Expansion joints ensure that in the event of an earthquake, or other natural catastrophe, only a single frame would fail. There would not be a progressive, domino-like collapse of the entire structure. Designers were not as concerned about seismic forces or extremely high winds – the strait is one of the windiest places in Canada – as much as "extremely high horizontal ice loads" smashing up against the bridge piers during the winter.

There are fears that ice flows could topple a pillar cemented, but not bolted, to the strait floor – although the federal government and

Opposite page top *View of the Northumberland Strait Bridge, looking towards Prince Edward Island.* ***Opposite page bottom*** *Typical marine span.* ***Below*** *Profile of the bridge, indicating the enlarged dimensions of the navigation span.* ***Right*** *Transverse cross section at pier location.* ***Bottom right*** *Staging facilities were used during construction. These were equipped with a slider track system which provided the most efficient means of moving the main components of the bridge along the various stages of production: from storage, to the marine jetty for load out by the heavy lift vehicle (HLV)*





Project	The Northumberland Strait Bridge
Client	Strait Crossing
Developer/engineer	Strait Crossing comprising GTMI (Canada) Inc, Strait Crossing Inc and Balast Nedam Canada Ltd
Conceptual design	Strait Crossing Inc
Contractor	Strait Crossing Joint Venture

the consortium refer to authoritative studies produced by acknowledged experts stating that there is nothing to fear. They say, for example, that specially designed conical-shaped ice shields will withstand the pressure of ice "ridges" up to 25 metres high.

Traffic, including a shuttle service for pedestrians and cyclists, will be monitored by closed circuit television and the bridge will also double as a utility corridor for electrical services, telephone, and other services to the island.

While the majority of the island's residents supported the bridge, some are less sanguine about its impact. Peter MacDonald, a native islander, is quoted as saying: "Maybe it will help the economy a bit , but I know a lot of places on the island where there's no one on the beach. Will this be the case in five or six years time?"

There are also those who doubt the drive across the bridge will take the presumed ten to 15 minutes (compared to 45 minutes by ferry), given the high winds and blowing snow, as well as ice build-up for much of the year. And there is some apprehension about vehicular (and possibly motorist) breakdowns or tractor-trailer truck mishaps on the 11 kilometre wide bridge, notwithstanding the emergency lane shoulders. With a million visitors expected over the peak July/August tourist season it may well be slow going. **WA**

Sheik Hussein Bridge

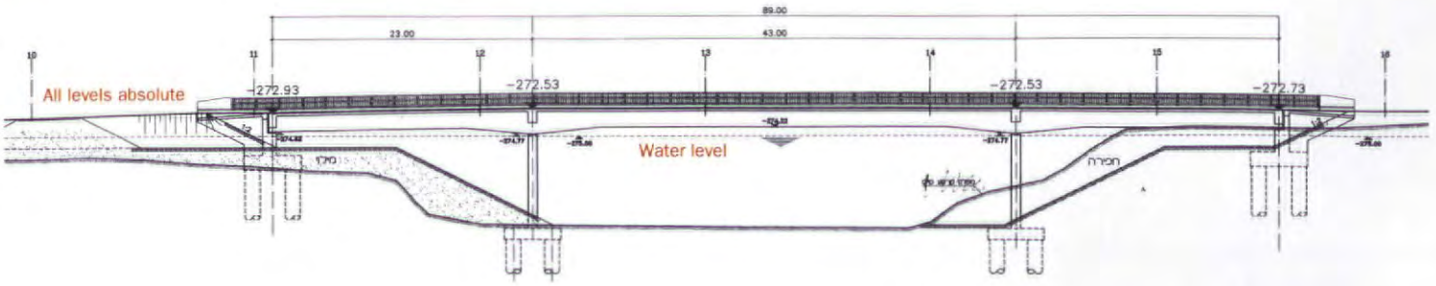
Jordan/Israel

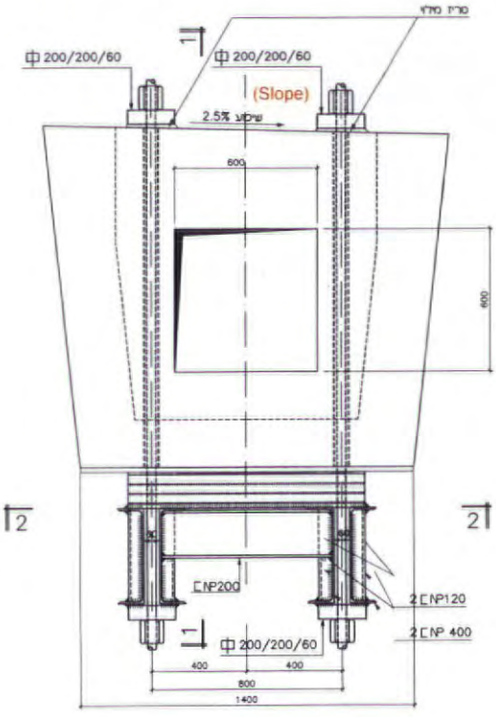
Consulting and structural engineers:
Yaron-Shimoni-Shacham Ltd

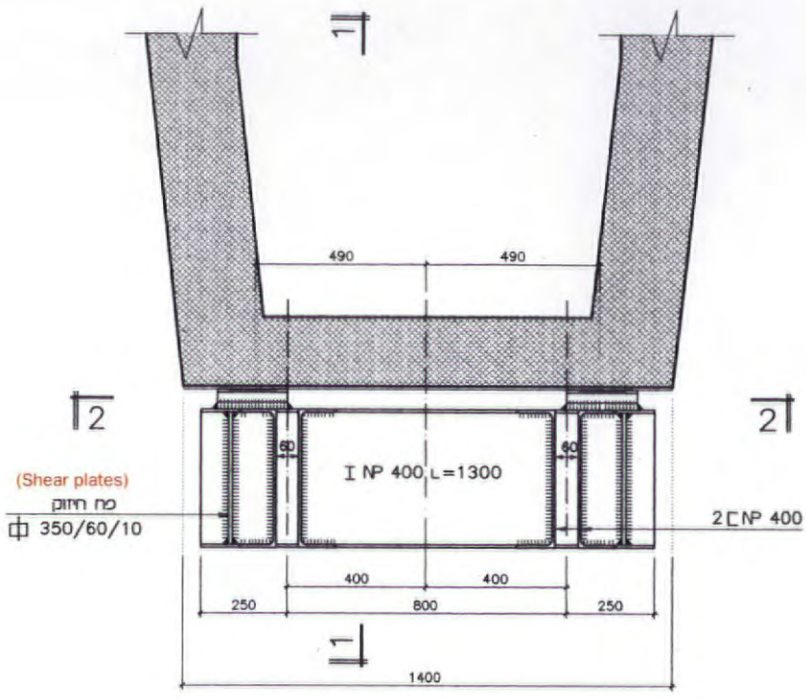
The peace accord signed by Jordan and Israel in 1995 called for the building of a Bailey bridge over the Jordan River, near the town of Beit Shean, three miles south of the Sea of Galilee. (Named after its British inventor, the Bailey bridge is a temporary structure of up to 40 metres in length. Originally used for military purposes, it was first introduced to Palestine by the British Army during World War 1.)

In the longer term, the peace agreement required the building of two parallel, two-lane bridges: one designed in Israel and the other in Jordan – each country was also charged with building the foundations on their respective side. It was agreed that the Israeli bridge would be the first to be completed. However, these proposals were only the latest in the history of a

Project	Sheik Hussein Bridge
Client	Department of Public Works, Government of Israel
Consulting and structural engineers	Yaron-Shimoni-Shacham Co Ltd
Contractor	Shafir Civil and Marine Works Ltd, Israel







bridge over particularly troubled water.

The plans hatched in 1995 came about in recognition of the burgeoning peace process and the effect that this was likely to have on both Jordan and Israel's commercial and tourist industries. But this hasn't always been the case. The original British bridge over the Jordan River – a steel structure built in the 1920s – was blown-up in 1945 by the Palmach, a Jewish resistance group, during the "night of bridges". It was rebuilt and destroyed again in 1948, during Israel's War of Independence.

In May 1995 Yaron-Shimoni-Shacham consulting engineers began designing the Israeli bridge, but given the site's history and its location on the Great Syrian-African Rift – an area of extreme seismic activity – precautions were necessary to ensure that the new bridge was safe from earthquakes. Raz Mor, project engineer, states that the bridge has been designed according to the American Association of State Highway and Transportation Officials (AASHTO) seismic code. Interestingly, no precautions have been taken to ensure safety from sabotage: "The peace agreement is based on good will" explained Mor, "... and so is the bridge".

In order to assist the construction process, and since the Bailey bridge could not carry heavy loads, a temporary dam was built. River flow was diverted through pipes under the dam, which itself was removed after the erection of the main girders. The Sheik Hussein bridge went on site in June 1996 and was completed in early January this year.

The 90-metre-long, 12-metre-wide structure has a main span of 43 metres. It is made of pre-stressed concrete, with two piers built in the water and abutments on the river banks. It is supported on drilled pile foundations.

Although the Sheik Hussein bridge is located 100 metres south of the original British bridge, the new project involved the removal of the foundations of the former in order to comply with river bank protection standards.

The construction of the Jordanian bridge is to begin in the near future. Design has been undertaken by Nippon Koei Co Ltd Consulting Engineers of Tokyo, Japan, as a result of a financial arrangement between Japan and Jordan. **WA**

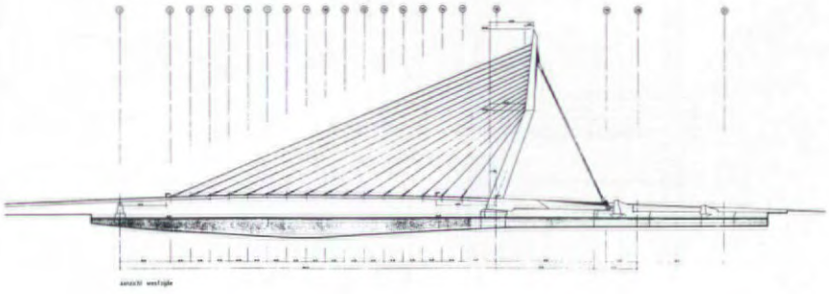
Opposite page *The main girders being put in place.* ***Top*** *Longitudinal section.* ***Centre left*** *Section through column.* ***Centre right*** *Section through girder, with support system – designed according to the AASHTO seismic code.* ***Left*** *The Bailey bridge – for pedestrian and light vehicular traffic – is in the background. During construction a temporary dam was built and river flow was diverted through pipes*

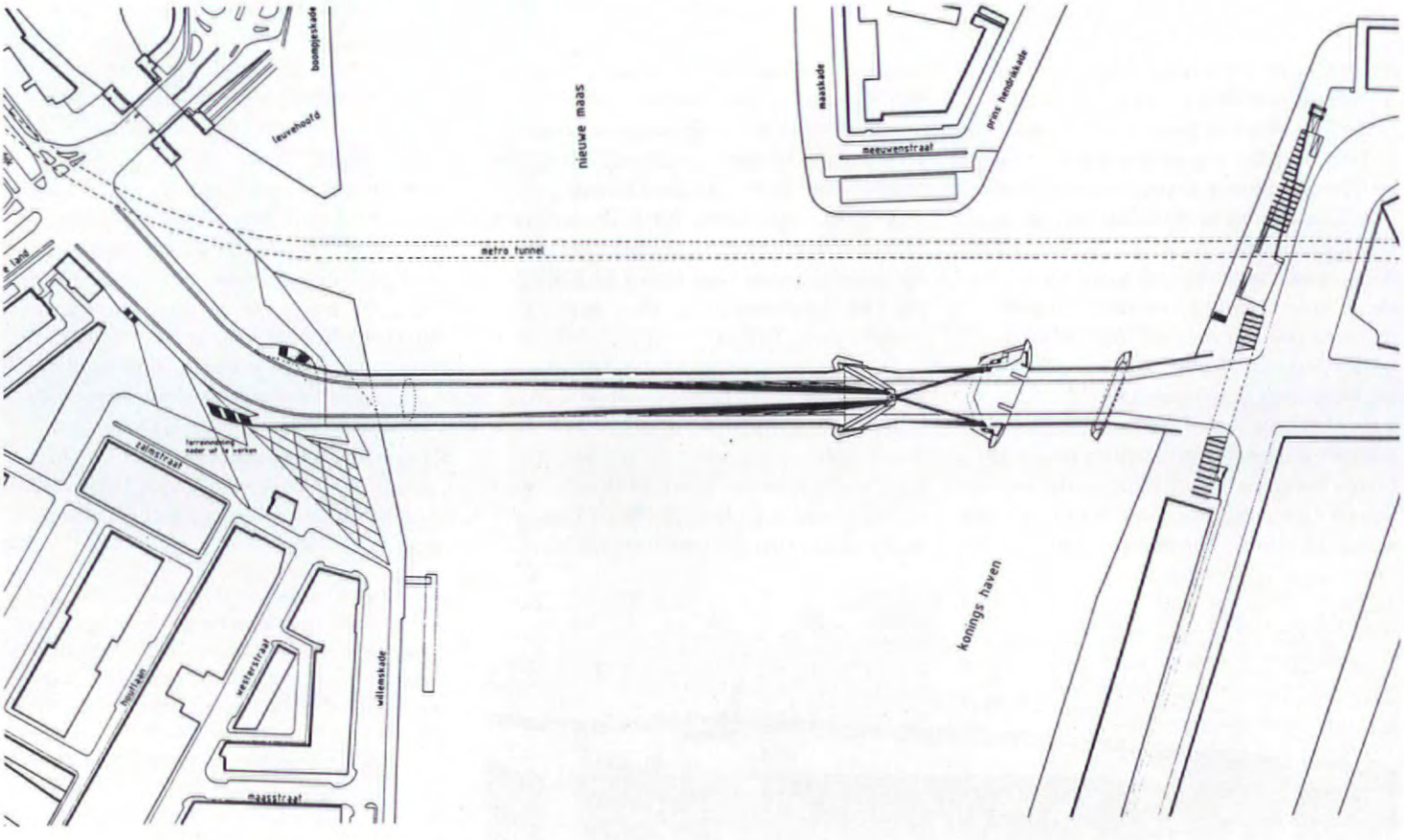
H-J Commerell

Erasmus Bridge

Rotterdam, the Netherlands

Architects: Architectuur Bureau van Berkel & Bos





Christian Richters

The Erasmus bridge not only provides Rotterdam with a symbolic gateway between the city and the North Sea, it also performs the practical purpose of linking the city centre and the up-and-coming Kop van Zuid area. In fact, the notion of dual identity could be applied to the bridge in several respects.

After its almost total destruction during the Second World War, Rotterdam was faced with an enormous rebuilding process. This was complete by the mid-1960s, by which time the city had a radically new identity. The ultra-modern "hardness" that came to typify the housing estates and schools of Rotterdam could almost be read as a reaction against the city's earlier ordeals. Today Rotterdam – the world's largest port – has an air of industrial unsentimentality, and it is this, combined with the city's modern form, that Ben van Berkel played upon in his design for the Erasmus bridge.

The bridge traverses the River Maas. Its gently curving deck is dominated by the 139-metre pylon rising above. The pylon's height is relatively restricted given that the ratio between the length of the bridge deck and the pylon is 2:1. The angle of the upper section of the pylon and the alternating tensions of the cables leading from it are intended to represent the tensions and dynamism of the land-mark project: it is at once part of the infrastructure and an urban symbol. The pylon's slender – at its peak it is only three metres wide – explicitly modern form perpetuates the tension between Rotterdam as a "rational", strictly de-lineated city and the bridge as an experimental structure.

Architect Ben van Berkel has stated that he is not so much interested in designing form, rather it is spatial organisation that interests him. It says much about Rotterdam that the Erasmus bridge is organised around an exaggerated, sculpturally minimal form that is both symbolically loaded and structurally distinctive. **WA**

H-J Commerell

Opposite page clockwise from above left *At its peak the slender pylon is three metres wide; diagram showing the distribution of cable stays along the bridges length; site plan showing the position of the bridge in relation to the city centre and the Kop van Zuid area.* ***Above*** *A view of the bridge from the road level showing the tapering pylon.* ***Below*** *View of the bridge from the Nieuwe Maas river*

Project	Erasmus Bridge, Rotterdam
Client	Gemeentewerken Rotterdam: Ontwikkelingsbedrijf Rotterdam (OBR)
Architects	Architectuur Bureau van Berkel & Bos
Technical consultants	Gemeentewerken Rotterdam: Ingenieursbureau Beton en Staal (IBS); Ingenieursbureau Havenwerken (IH); Ingenieursbureau Wegen Waterhuishouding (IWG). Afd.
Project management	Energie Bedrijf Rotterdam – Centrum (ENECO); Lighting Design Partnership
Contractors	Heerema Havenbedrijf bv; Groot Dordrecht bv; Compagnie d'entreprises CFE SA; NV Maatschappij voor Bouw – en Groundwerken; Ravestein-Noell

The Tatara Bridge and the Nishiseto Expressway

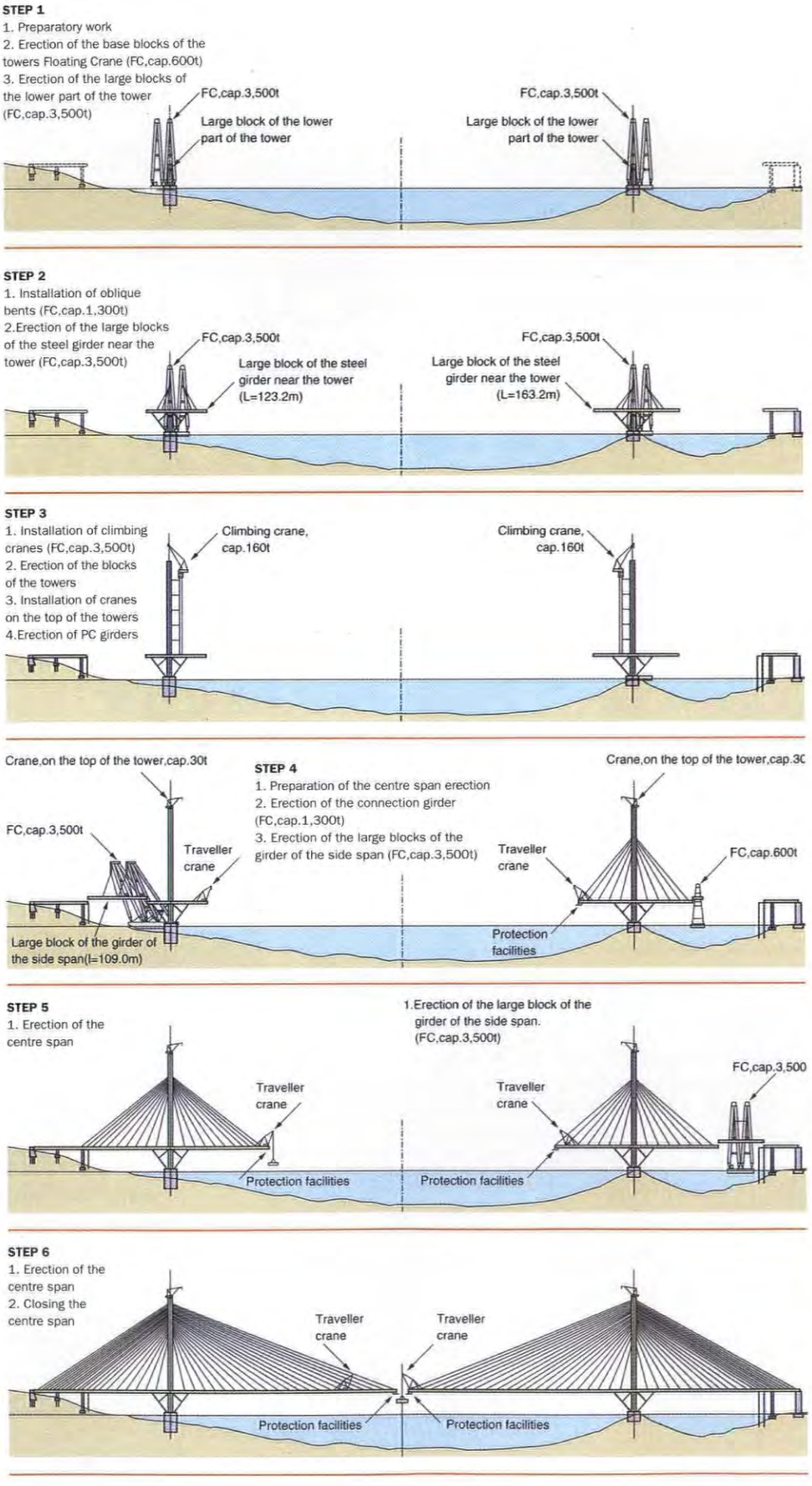
Japan

Engineers: The Honshu-Shikoku Bridge Authority (HSBA)
Text: Alan Burden

Once complete the Tatara Bridge, one element of the third link across Japan's Inland Sea in the west of the country, will provide access between Honshu and less-developed Shikoku. The toll-road links six islands over a distance of 60 kilometres. It is due to open in 1999 bringing an important stimulus to the economy of the region.

The route includes nine major bridges displaying a wide range of structural forms. When approaching from the Honshu side, the Onomichi Bridge (1968) is the first in the link, it was also the first major cable-stayed bridge completed in Japan. The clear articulation of the main elements, particularly the pinned feet to the towers, provides an historic link back to an era where structural design was more limited by the degree of analysis

Opposite page top *Photo-montage of the Tatara Bridge, the final element of the third Honshu-Shikoku link across Japan's Inland Sea. It is due to be completed in 1999.*
Opposite page bottom *Map showing all of the three links.*
Below *The six steps – in descending order – in the erection of the superstructure of the Tatara*



available to engineers.

Onomichi is contrasted by the modern Ikuchi and Tatara cable-stayed spans. The Tatara is still under construction and when complete will be nearly twice the length of the Ikuchi. Care has been taken with the aesthetics of the Tatara's tower forms. Surface relief in the steelwork and sensitive chamfering of edges and tower tops has produced a slender, soaring appearance. Technically the light steel centre spans and heavier concrete side spans make possible very long bridges. The Tatara will be the world's largest cable-stayed bridge with a span of 890 metres exceeding the recently completed Normandie Bridge in France by about 30 metres. Great care was taken to ensure aerodynamic stability using wind tunnel testing to develop an optimum deck cross-section.

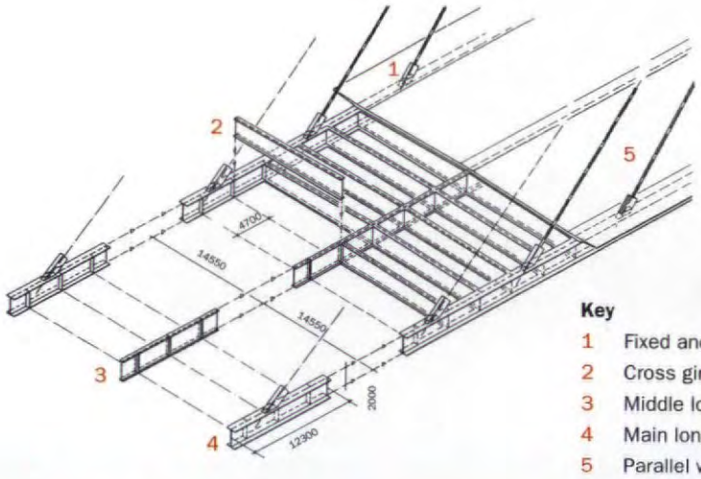
The Tatara, like all the structures on the Expressway, is designed to withstand winds of over 100 miles per hour (160 kilometres per hour), and earthquakes of magnitude 8.5 on the Richter scale.

As with the other bridge links constructed across the Inland Sea, construction has often been difficult. Foundation work has been accomplished in the fast flowing waters close to international shipping lanes. The works have required a national construction effort comparable with projects such as the Delta works in the Netherlands.

After the Tatara comes the Ohmishima Bridge, the only arch on the route. There are also three suspension bridges; Innoshima, Ohshima and Kurishima. Their long spans provide the final step to Imbari on the Shikoku side.

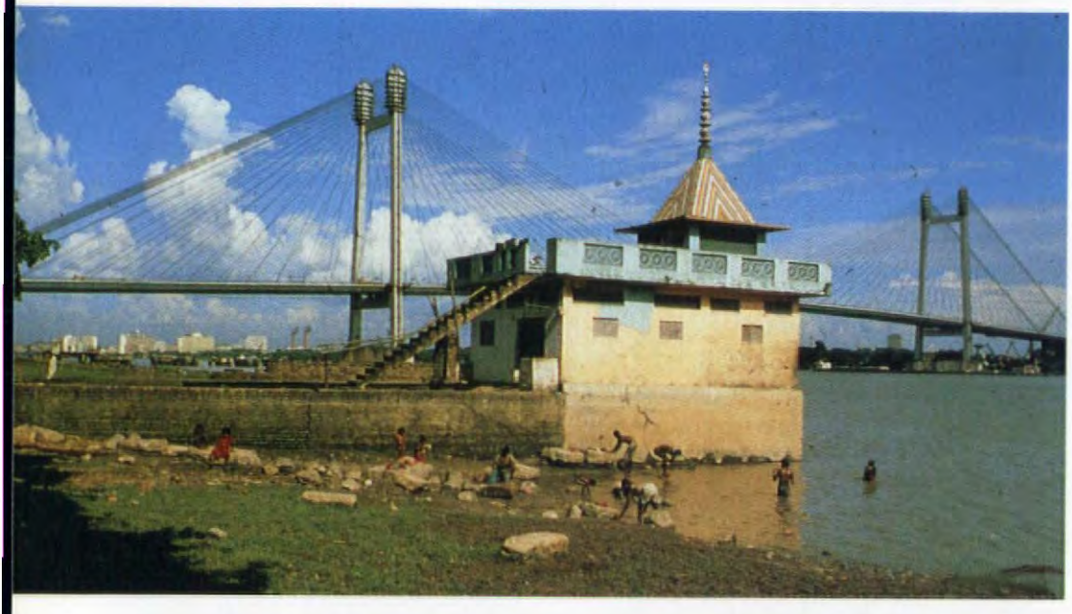
After thirty years planning and construction, completion of the third and final link before the millennium will be another major achievement for the sponsor, Honshu-Shikoku Bridge Authority. **WA**

Project	The Tatara Bridge, on the the Nishiseto Expressway
Client/sponsor	The Honshu-Shikoku Bridge Authority
Engineers	The Honshu-Shikoku Bridge Authority Third Construction Bureau, comprising the Mukaijima and Imabari Construction Offices; and the Mukaijima and Ohmishima Operations Offices



Key

1 Fixed anchorage
2 Cross girder half
3 Middle longitudinal girder
4 Main longitudinal girder
5 Parallel wire bundles



Hooghly River Bridge

Calcutta, India

Engineers: Schlaich Bergermann & Partners

Above *One of the pylons for the bridge showing the position of the cable stays.* ***Top left*** *Construction diagram of a section of the bridge.* ***Bottom left*** *View from the bank showing the double pylon supporting the span of the structure*

In 1969 Gandhi laid the first stone for the bridge in Calcutta, India over the River Hooghly, in 1969. However, due to internal politics, nothing further was built until the present bridge by the German firm Schlaich Bergermann & Partners in 1992. *World Architecture* asked the German engineers for an informal maintenance report.

The bridge connects Calcutta's 15 million inhabitants to Howrah's population of three million, and beyond to the rest of the Indian sub-continent. In order to stand up to the strain of heavy traffic the engineers used "a thick cover for the reinforcement of the concrete slab, thick and robust steel plates which would not suffer from corrosion, well protected cables and all details were made easily accessible for inspection and maintenance".

However, to reduce the cost in view of the cheap labour Jorg Schlaich explains "we specified a lower-cost local paint, which needs to be repainted at shorter intervals than some of the more expensive European brands". Despite their frequent reminders, the maintenance routine has not yet been installed, although to the engineer's knowledge, no lasting damage has occurred.

In retrospect Schlaich explained that "instead of using holding-down cables at the two end supports, which were costly and difficult to install, we would now use steel plate pendula". Although this alternative sounds "old fashioned", the engineers successfully applied it recently on a large cable-stayed bridge in Greece.

Schlaich also said that they were asked by the client to design a steel bridge in the predominantly steel-structured urban landscape of Calcutta. To avoid welding, they designed a composite structure: a concrete slab on a steel grid. "At that time we felt this to be the right solution under these 'third world' conditions." This technique has since been used to produce a progressive design for highly industrialised countries, as the Annacis Bridge in Vancouver shows." **WA**

Client	HRBC Hooghly River Bridge Commissioners, Calcutta
Engineers	Schlaich Bergermann & Partners
Check engineer	Freeman Fox Ltd, London
Superstructure	Construction Company Calcutta
Substructure	Gammon India Ltd, Bombay

Top *The two 104-metre-long bow strings were pulled into place from one side of the canal to the other, with the aid of temporary piers and cables, and the leverage provided by the 12-metre abutment on each side.* ***Above*** *View over Strasbourg illustrating the intersection of the canal and the river. The bridge is in the foreground.* ***Below*** *The belvedere on the pedestrian deck, separated from vehicular traffic by a wooden noise barrier, provides an area for relaxation and a view over the channel.* ***Right*** *Elevation of the bridge*

Bridge over the Marne-au-Rhin Canal

Strasbourg, France

Architect: Alain Spielmann
Photography: Airdiasol/Rothan

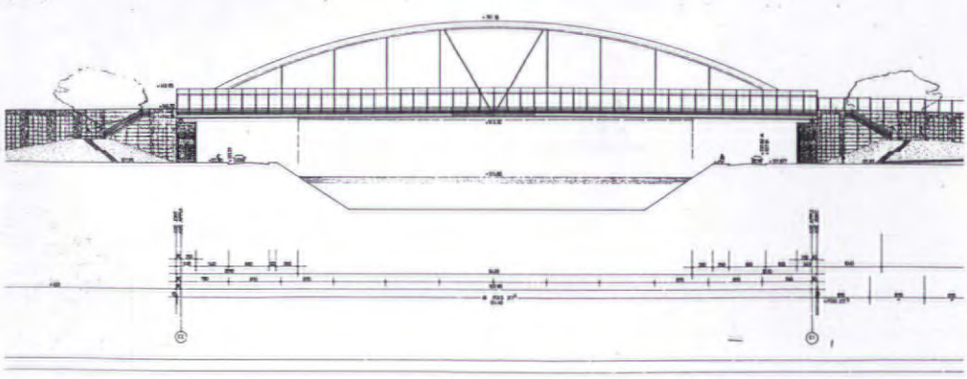
Project	Bridge over the Marne-au-Rhin Canal, Strasbourg
Client	Urban Community of Strasbourg
Architect	Alain Spielmann
Consulting engineers	Scetauroute/Serue
Urban and landscape planners	Alfred Peters/ JNC International
Contractor	Muller Travaux Publics

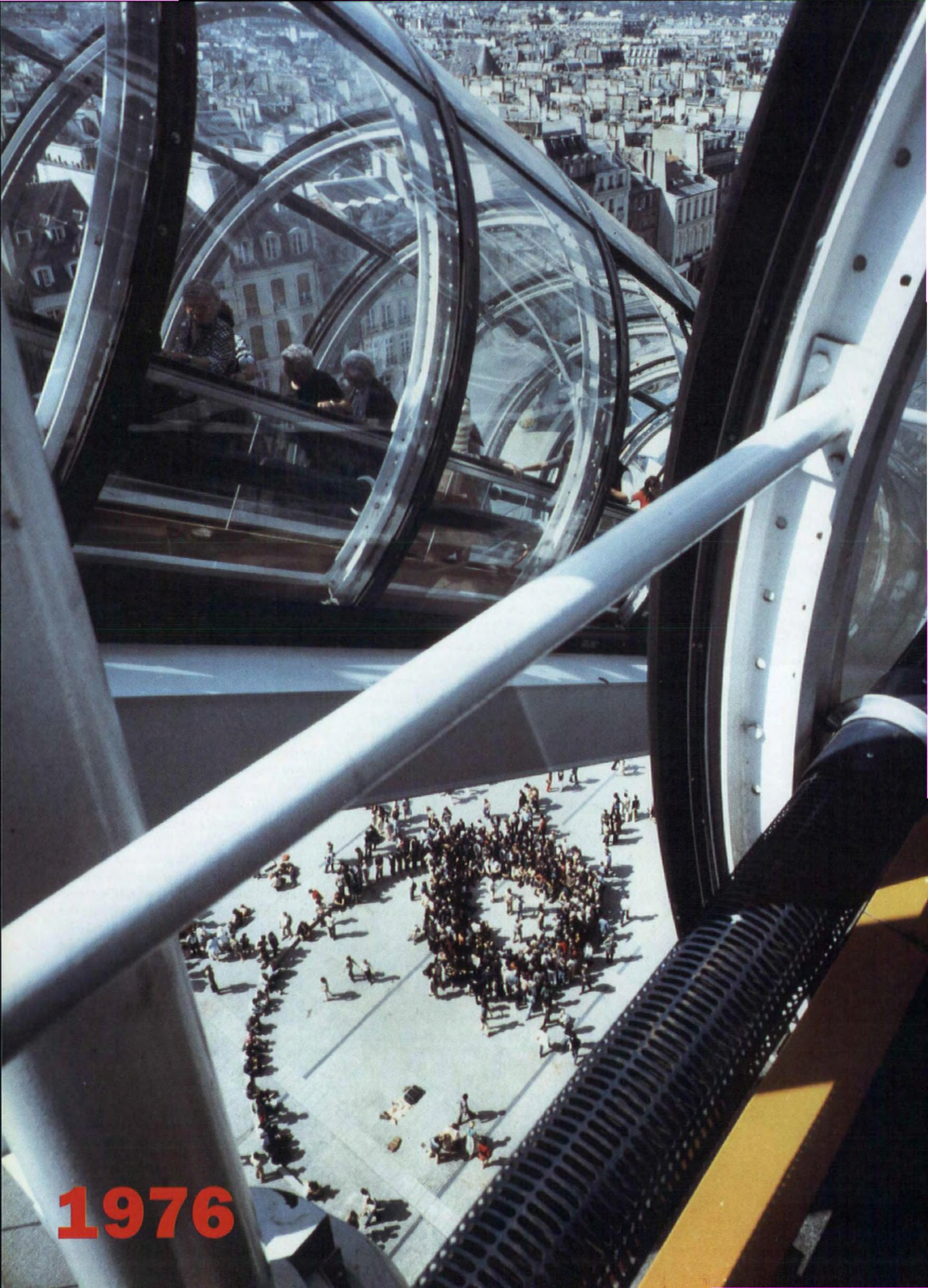
Alain Spielmann (see Face to face) won the contract to build the Bridge over the Marne-au-Rhin Canal, Strasbourg in a closed competition, in 1993. The brief required a landmark project that would serve as a symbol of entry at the *Porte de la France*, as approached from the German side of the river.

Of the four proposals Spielmann's was the only one that did not accept that the competition brief was necessarily correct. Instead of using columns to span the 60-metre canal, Spielmann chose to base his design around two 104-metre bow-strings. The intention was to minimise the impact of the new structure on the surrounding environment.

Moving the two 104-metre-long, 15-metre-high, 750-ton steel bow-strings into place was a complicated procedure – but the method was preferable to building either structural columns in the canal or visually demanding cable-stay pylons. The steel bows, which are each made up of 12 separate elements, were moved into place using a "launching" system. The structure was literally pulled from one side to the other with the help of temporary piers and cables, and the leverage provided by the 12 metre abutment on each side of the canal in the space of four hours. The pre-cast 12.4-metre wide deck surface was added later.

The bridge serves both pedestrian and vehicular traffic: the two functions are separated by a wooden noise barrier. A belvedere is located on the pedestrian deck – which is three metres wide – from where people may take in the view over the channel. **WA**





1976

In 1976 the Georges Pompidou Centre represented a vision of modernity, its exposed services a bold architectural gesture based on honesty of construction and practicality. Twenty years later not only is the Pompidou in need of a radical re-fit but its design blueprint has been bypassed by the subsequent generation of designers and architects. Building services and building management in the mid-1990s are in the hands of microprocessors and PC-driven network systems. Timothy Ostler reveals that 20 years is, indeed, a long time in building services.

From hanging out to tucking in

In the last five years two parallel trends have swept across architecture and environmental engineering. The kind of "precision architecture" represented by Sir Norman Foster, IM Pei or Renzo Piano has begun to define the mainstream. At the same time a new generation of services engineers has begun to embrace holistic, low energy design in a big way. In contrast to all the pipes and ducts displayed at Rogers' and Piano's Pompidou Centre only the ubiquitous stainless-steel chimney – and perhaps lifts – now tend to get exposed to view. Those who first made their name with heavily serviced buildings inspired by the tubular excrescences of oil refineries are now devoting themselves to doing more with less.

The single most powerful technical factor guiding these developments has been the availability of cheap computing power. With spreadsheets and even simulation software now widespread amongst environmental designers, and mountains of research data available, there can be few excuses for continuing to hide behind rules of thumb.

Equally, computers are now increasingly used not just for co-ordinating environmental design parameters before construction but also during occupation as part of a building management system. Technology has been advancing, too, in fields such as solar energy, where panels have long since attained the status of elegantly engineered, branded products.

Meanwhile, with the once-universal CFC now dislodged and banned from manufacture in the developed world, the air-conditioning industry is entering a period of instability that will probably continue until a widely-agreed consensus is reached on future refrigerants. This may take some time; as even the HCFCs will have to be discontinued within the next 10-15 years – Germany and Denmark have both pledged to move to HFCs – research continues apace into other technologies.

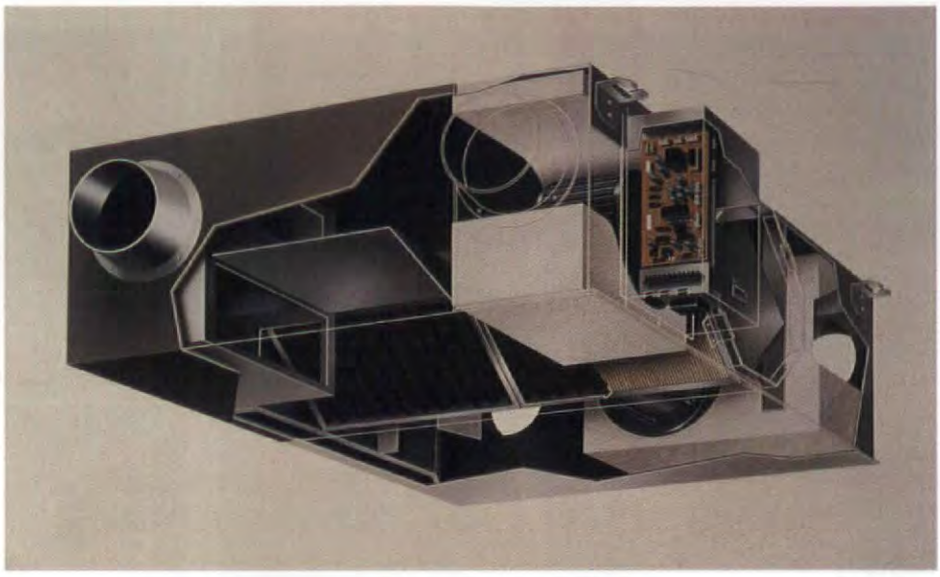
Air cycle refrigeration is a technology widely used in aircraft that remains economically out of reach for building applications, but is currently being evaluated by the UK's Building Research

Opposite page *The Pompidou Centre (1976), by Richard Rogers and Renzo Piano quickly earned its place in the architectural consciousness. Its exposed services and ductwork were a radical departure from the burgeoning trend for "precision architecture", which has since become more widespread. Twenty years after completion the Pompidou is undergoing a complete reorganisation. Philip Gumuchdjian, of RRP, notes that the redesign has come about due to practical and technological changes. The Pompidou was designed as a flexible structure, and was thus intended to evolve from the original design.* ***Above*** *The air vent is beginning to attract the attention of designers, as can be seen in Waterloo's new Aircell range, featured here in the RAC Regional Centre, by Nicholas Grimshaw and Partners near Bristol, UK*

▲ Arcaid


1996

Opposite *The stainless-steel chimney is one of the few building elements regularly exposed to view in the mid-1990s. Selkirk's Europa duct system has been installed as two extra ducts at the new Coates Lorilleux industrial inks factory in Harlow, UK by Clive E Bareham.* ***Below left*** *Satchwell's digital climatronic controller is an easy- to-use, cost-effective heating and ventilation control system.* ***Below right*** *Daikin's VAM 250 ventilation unit a product of Japanese government-sponsored research into energy saving Variable Refrigerant Volume (VRV) systems*



Establishment. Elsewhere, research is proceeding into more exotic refrigerants, such as water vapour, carbon dioxide and even ice slurries.

The basic design principles behind systems have also seen a certain amount of movement. Chilled ceilings (or beams), often in conjunction with displacement ventilation, are gradually becoming established outside their home markets in Scandinavia. Their strength lies in steady state situations and narrow plans. They also have the virtue of silence although some consider this to be a disadvantage, failing to mask ambient noise and conversations as conventional systems do.

Japanese manufacturers, meanwhile, hold a special brief for Variable Refrigerant Volume (VRV) systems. These were first developed in Japan as a result of government-sponsored research to save energy following the oil crisis, but did not come to Europe until 1988. Hitachi, Toshiba and Daikin all distribute competing systems: the last of these claims by now to have carried out 25,000 successful installations across Europe. Advantages claimed over conventional systems are VRV's exceptional economy – thermodynamically, the refrigerant is 10 times more efficient than water and 50 times more efficient than air – and the directness of cooling and heating without intermediate heat exchangers. It is also modular, economical to install and better able to adapt to low cooling and heating loads.

Daikin market VRV as part of their Hi-VRV package, which combines it with a heat recovery and the D-BACS energy management system – market sectors that both seem to be developing rapidly. Heat recovery products now extend from the system-based products exemplified by Daikin down to units for everyday domestic ventilation marketed by Vent-Axia.

Heat recovery is a natural feature of buildings designed not just for economical but for low energy design. The jury is out, however, on whether mechanical ventilation or automatically operable windows or vents makes for the most economical system. More superficially, Waterloo's new Aircell range of valves show that even the humble air vent is beginning to attract the attention of designers.

Some idea of the potential benefits to be gained from an intelligent approach to building services control can be gauged from the example of Dubai International Trade Centre and Hotel. Here, in the tallest building in the Middle East, a BAS 700 building management system supplied by Satchwell some years ago is claimed to have reduced the lighting load by 45 percent, saving its owners £6,000 a month.

The scope of the system – which services all HVAC functions throughout the complex – extends to measuring fan and pump bearing temperatures and the pH and conductivity of water to reduce the incidence of corrosion in major items of capital plant.

Intelligence is becoming almost obligatory in describing anything electronic. ACL-Drayton's DC1100 heating controller, intended for small-to-medium sized commercial applications, includes a self-configuring mode allowing it to automatically adjust to the application. Meanwhile Grundfos recently introduced a range of intelligent heating pumps or circulators that self-adjust to changing system requirements.

Information on up to 64 of these circulators can be sent to a central BMS and linked to other data such as ventilation and lighting. As part of the creeping consumerisation of technical equipment, an infra-red hand-held remote allows control to be effected as easily as for a domestic VCR.

Some of the factors boosting computer networks in other contexts have also inspired the increasing integration of BMS across open standards. One such is Echelon, backed by some of the biggest names in the industry – amongst them Honeywell. Another is the Compass Network, by North Communications, who claim that it is the first co-ordinating network developed specifically for building systems.

Based on these developments, the overall impression is that both architecture and environmental design are approaching the status of exact sciences. The more that microprocessors are used in the design and management of buildings, the more tightly defined will be the architecture. And all the better for that. **WA**

"Intelligence is becoming almost obligatory in describing anything electronic"

Servicing the green skyscraper

In all the traditional utopian visions of ecological paradise skyscrapers are conspicuously absent amongst all the wind turbines and solar houses. *World Architecture* canvases the opinions of two experts; Mahadev Raman and Ken Yeang, both of whom put the case for the defence of tall buildings with a conscience.

The low-energy skyscraper would seem to be a contradiction in terms. But there are now some architects looking to use scale as an opportunity to generate power, whether via wind turbines or photovoltaics. Even the cantilever atop Calatrava's latest proposal for City Point in London (see News review) looks as ready to receive a photovoltaic ray as a rooftop restaurant. The lightness and delicacy of this tower is wholly evocative of low energy. Can performance follow suit? And what are the essential issues raised in servicing a skyscraper?

"I don't think the fact that you're building something so high up in the air automatically makes it energy-hungry," says Mahadev Raman, services engineer, principal of Ove Arup & Partners in New York and a member of the Council on Tall Buildings and Urban Habitat (CTBUH). "The only thing that you have to worry about is how you get your energy up and down the building and whether that uses any more in the way of power."

Skyscrapers are above all concentrators of forces. The key issue is pressure – of wind on air intakes and exhausts, of water on pipes, of passenger traffic on lifts.

The first of these will be made a little easier in future by innovations such as Otis' new Odyssey system (see Product review). Tackling the second is a matter of using wind-tunnel tests to identify pressure profiles and locate vents accordingly. The third is a little more complicated.

"If you have a closed circuit, for example, like a chilled water circuit," says Raman, "the fact that you're sending the water up and down, and there are enormous static pressures at the bottom, does not intrinsically make the system more energy-hungry. The weight of the water on the way down pulls the water up on the way up, and all you're overcoming is the friction of the water in the pipes."

The pressures generated, however, can be intense. "Imagine you have a 50-storey building with a single chilled

Opposite page left *Mahadev Raman, services engineer, Ove Arup & Partners, New York.* ***Right*** *Ken Yeang, originator of the bioclimatic skyscraper.*

This page top *The cantilevered restaurant at the top of Santiago Calatrava's City Point, London.* ***Centre*** *The CR16 booster pump by Grundfos Pumps Ltd.* ***Bottom*** *The award-winning Menara Mesiniaga, Malaysia by Ken Yeang of TR Hamzah and Yeang (See the Malaysia Country Focus in November's* WA *for further news of Yeang's work)*

water loop going up and down", says Raman. "If you want to take that chilled water and circulate it through a chilled ceiling, on the second or third floor, you have the static pressure of all the water system acting on those chilled ceiling components."

These problems can be minimised either by using heat exchangers to break up the circuit or by specifying suitably pressure-resistant equipment. Meanwhile, in open systems (hot and cold water supply) there is no opportunity to balance supply and return supplies – short of driving turbines from the waste water, a tricky business that nobody seems to have tried as yet.

"To generate sufficient pressure at the base to pump all the way up a 100-storey building is quite serious stuff," says Raman. "Every ten metres of water gives you something like one atmosphere of pressure. So a 100-storey building is going to give you 30-40 atmospheres of pressure.

"That's pretty big, so you can't have a set of booster pumps in the basement doing that... one set will probably get you up 20 storeys without any difficulty."

With electrical services, meanwhile, the special characteristics of a skyscraper and the need for periodic substations and switchrooms have nothing to do with gravity and everything to do with scale. It is the scale and degree of exposure that makes the prospect of photovoltaic cladding so enticing.

Raman is sympathetic to the technology, but points out that it is not quite ready for prime time. "At the moment the payback periods for photovoltaics can be anywhere from 20 to 50 years. But as they become more widespread I expect that cost to come down."

Scale is a more negative factor in the question of natural ventilation. "If you start making a building wider than 15 metres or so," says Raman, "then you start losing the ability to ventilate it naturally... If you are building relatively low buildings, you can keep them to a fairly narrow plan. But building very tall buildings in that way is more difficult. By their very nature, as they start getting taller you end up with structural requirements for the floor plate".

A leading authority on this issue is the Malaysian architect Ken Yeang, originator of the bioclimatic skyscraper, and author of a number of books on the subject including, most recently *The Skyscraper: Bioclimatically Considered. A Design Primer. Academy Editions, London £29.50.*

"A naturally ventilated office building is possible," says Yeang, "but you either have to put in a lot of automated devices, or you have to go round and open and shut windows all the time, depending on the wind speed of the outside. Most clients will want an air-conditioned building anyway, but we say to them we'll design in such a way that they have the choice of natural ventilation if they want it."

Yeang's summary of the key issues surrounding the green skyscraper is clear and systematic. "If you want to design a tall building as an ecological building, then you have to look at four aspects: the inputs to the building, the outputs to the building, the operations of the building and the impact of the building on the site. Inputs and outputs can be measured in terms of materials and energy."

Inevitably, it is fundamental configuration and not hardware add-ons that is the main factor underpinning a genuine low-energy building. "Sixty percent of the energy used in its entire life-cycle is in its operations base ," says Yeang. "So if you want to reduce the energy use in a building... you should design a skyscraper which is low energy in a passive way, so that any electrical or mechanical systems that you put into it enhance its energy efficiency. But if you don't configure the building properly in the first place through bioclimatic principles, then some of the electromechanical devices you put in will have to correct the mistakes you made in the first place, and that makes total nonsense of a low-energy building." **WA**

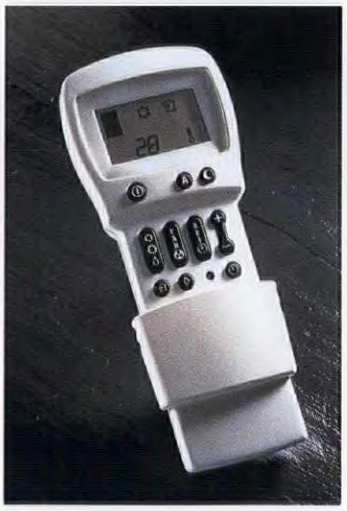
Olimpia Splendid SpA
Air conditioning system: Clima Più
Design: King Miranda Associati

Clima Più, designed by King Miranda Associati for Italian company Olimpia Splendid offers a new approach to the domestic air conditioning system, something that is usually regarded as an appliance or a piece of machinery. What they have done is to focus on the design, treating it as an object in its own right rather than something that can be hidden away. The result is a system composed of three elements: the external unit (usually hidden on roofs or balconies); the High Wall Split internal unit with its smooth housing; and a remote control unit which manages all the functions.

The key to the design has been to remove the unsightly grille commonly found on the front of air conditioning units and relocate it at the back. Air is subsequently drawn in from the rear reducing the problems of dirt collection on the front of the unit. Alternatively, fresh air can be drawn in directly through the wall from the external unit. Noise levels have also been considerably reduced. This front-to-back approach has allowed King Miranda to concentrate on the design and finishes of the internal unit which has adopted a stream-lined look in ABS plastic moulding. Air is output through a motor-controlled flap at the front which adjusts automatically according to the output temperature – for cooling, it is fully open with air flowing horizontally, while for heating, the air is directed downwards. When not in use, the flap closes automatically. A discreet flap at the top of the unit allows access to the filter for cleaning and maintenance.

All functions are managed via a hand held remote control device with the secondary command buttons housed in a retractable compartment. Hieroglyphics denote the various functions which include speed settings, an hourly on/off timer and a nocturnal mode.

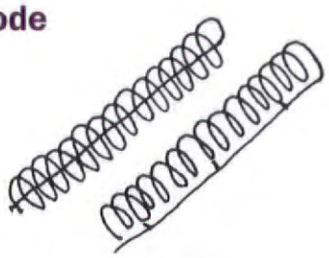
Clima Più went into production last year and is available in various sizes and colours. It has recently been awarded the Janus Design Award in France. **WA**



Above *Design sketch of Clima Più, demonstrating the system's modifications to the traditional air-conditioning configuration*

King Miranda Associati's Clima Più air conditioning system focuses on design, highlighting rather than hiding the key elements. ***Far left, top*** *External unit.* ***Far left, bottom*** *High Wall Split internal unit, here shown closed.* ***Left*** *Remote control, with external keyboard cover open*

Bisque
Radiator: Hot Springs
Design: Priestman Goode



Following the success of the now classic Cactus radiator three years ago, London's Royal College of Art-trained Paul Priestman and British manufacturer Bisque have once again collaborated to produce an exciting and equally radical heating product.

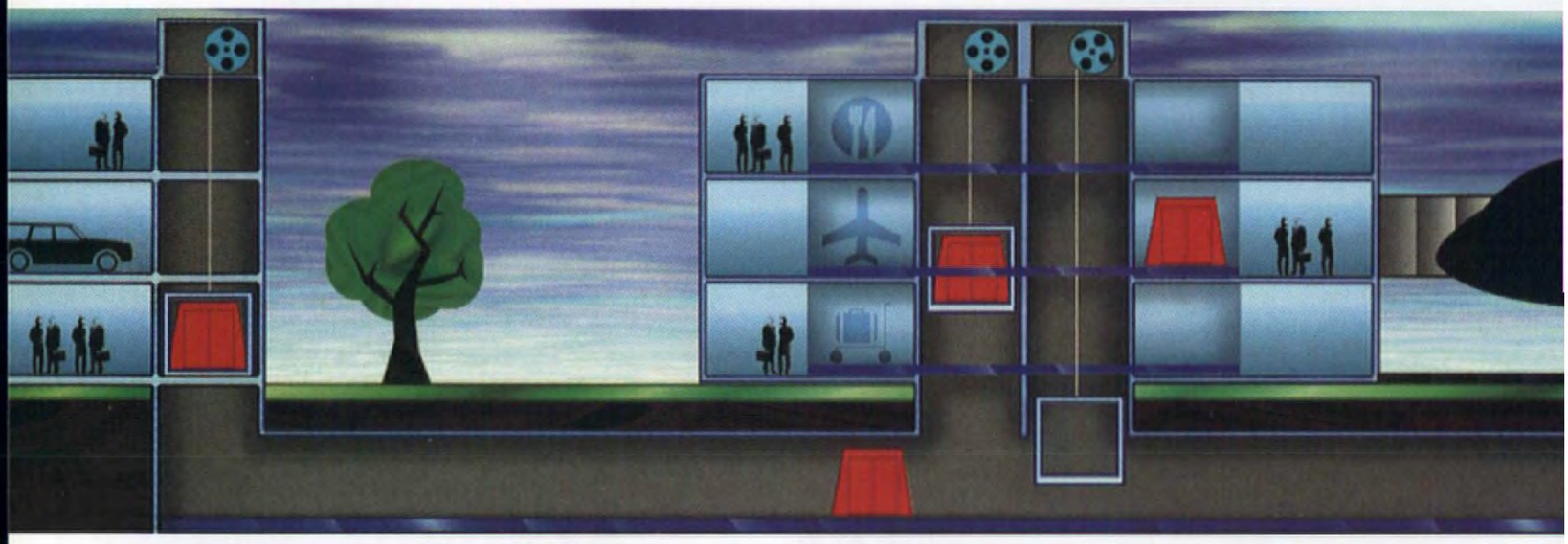
Hot Springs was launched to the British public in October last year, following nine months of development. The design is a simple one based on a continuous coil of steel tubing. This not only makes the radiator economical to produce but, due to the amount of tubing, also provides a high standard of heating efficiency. The development programme was a joint one with Priestman designing the sizes and finishes, and Geoffrey Ward of Bisque, with his plumbing background, making it practical and easy to install. The spiral itself is 200 millimetres in diameter and welded at intervals to the straight backpipe, to provide rigidity. Flexible connections and wall mounted brackets allow the radiator to be clipped off the wall to facilitate cleaning or painting.

Traditionally, radiator design is a closed shop, so it is not surprising that Hot Springs has already received rave reviews. "We see it as a long term product" says Priestman "aimed at the top end of the market". Offered in three sizes and a range of colourful finishes and stainless steel, this is one radiator that deserves to be noticed. **WA**

Left *The now classic Cactus radiator was awarded the Design Week Best Product of the Year Award, 1993.* ***Top left*** *Design sketch of Hot Springs, launched in October last year.* ***Top right*** *Detail of Hot Springs. Though radical in appearance, the design is based on a continuous coil of steel tubing, 200 millimetres in diameter.* ***Main picture above*** *Hot Springs is available in three colours*

Otis Elevator Company
Integrated building transit system: Odyssey

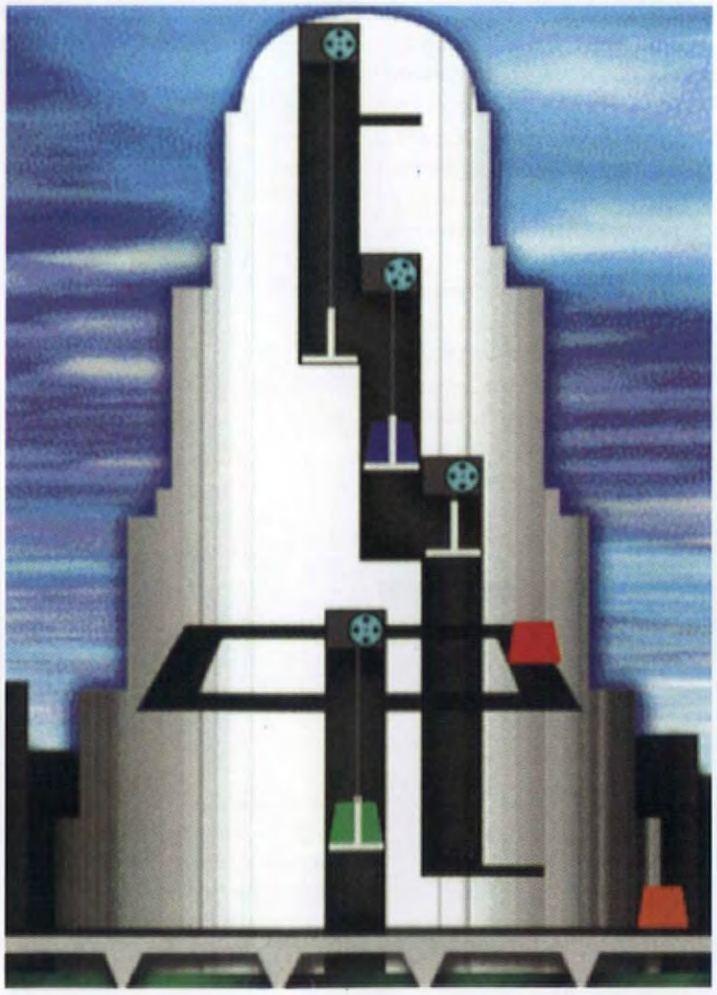
Below *Odyssey, the Otis Elevator Company's dispatching, control and automated people-mover integrates horizontal and vertical movement. The system is capable of moving between parking areas, through on-site facilities and on up the building*



The first safety elevator, invented by Elisha Graves Otis in 1852, paved the way for the vertical growth of our cities. Fifty years on, the Otis Elevator Company, as it became, produced the escalator, and today the same company has developed Odyssey, the first "integrated building transit system". If successful, this latest innovation in people movement will allow architects to build as wide or as high as they like without having to think about elevator loadings or integrating machine rooms.

Currently the height of buildings is restricted by the limitation of elevator technology – any building taller than 600 metres poses a problem. However, the new Odyssey system solves this dilemma by using shaft space more efficiently than present systems. The design allows passengers to board the glass enclosed Transitor™ cabs outside the lift shaft, enabling more than one cab to use the same shaft at any one time. And because the cab is a separate unit, it can continue its upward journey *ad infinitum* simply by side stepping from one shaft to the next. The result is fewer lift shafts, no machine room and thus more rentable floor space.

But Odyssey is not just the answer to the problems of the plethora of tall buildings currently being proposed around the globe. With the potential for unlimited horizontal and vertical movement this new invention can also accommodate a sprawling building complex such as an airport or shopping centre, using the same Transitor cab to take people or passengers from the underground car park through the maze of connected buildings to their final destination. And it can be used to connect structures underground, providing complete door-to-door transportation within the city centre, whatever the weather. Could this be the end of public transport as we know it? **WA**



Right *Currently one of the major restrictions on the height of buildings over 600 metres is the limitation of elevator technology. The Odyssey system overcomes this shortcoming by means of the Transitor™ cabs which are boarded outside the lift shaft*

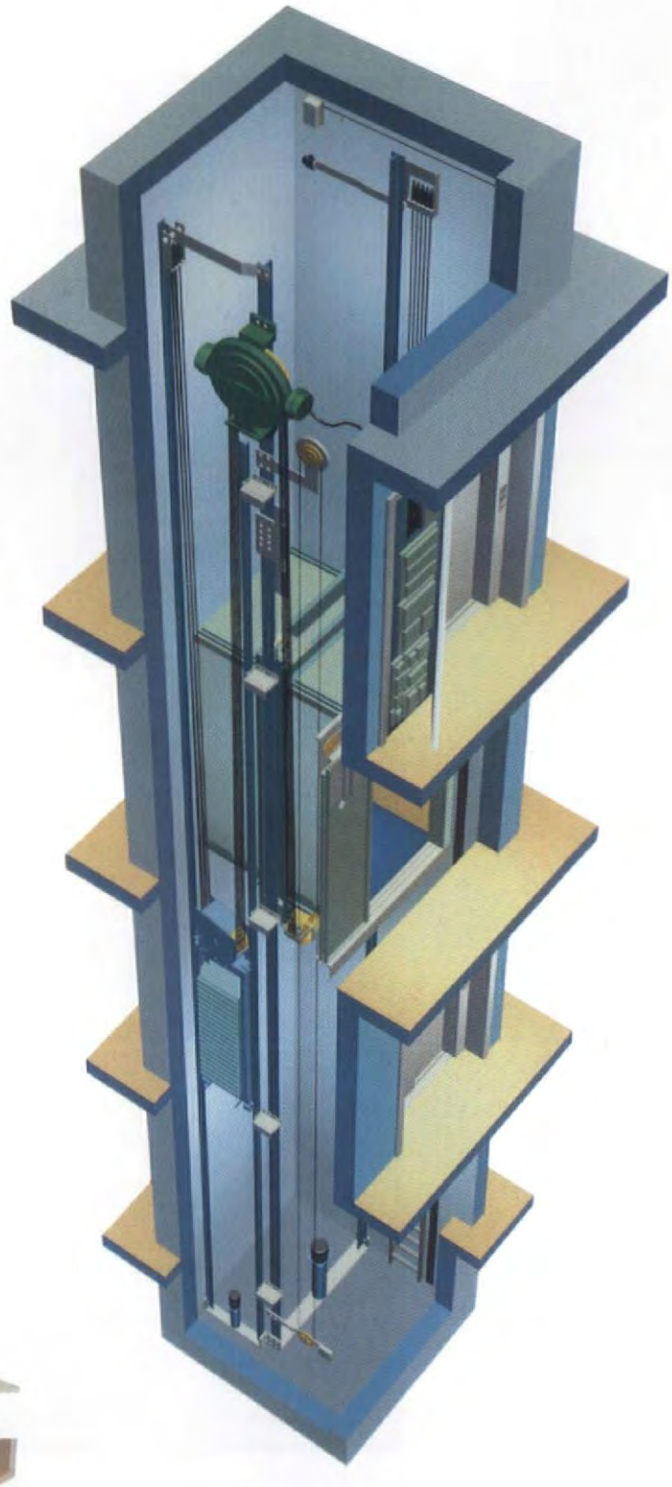
Kone
Elevator: MonoSpace

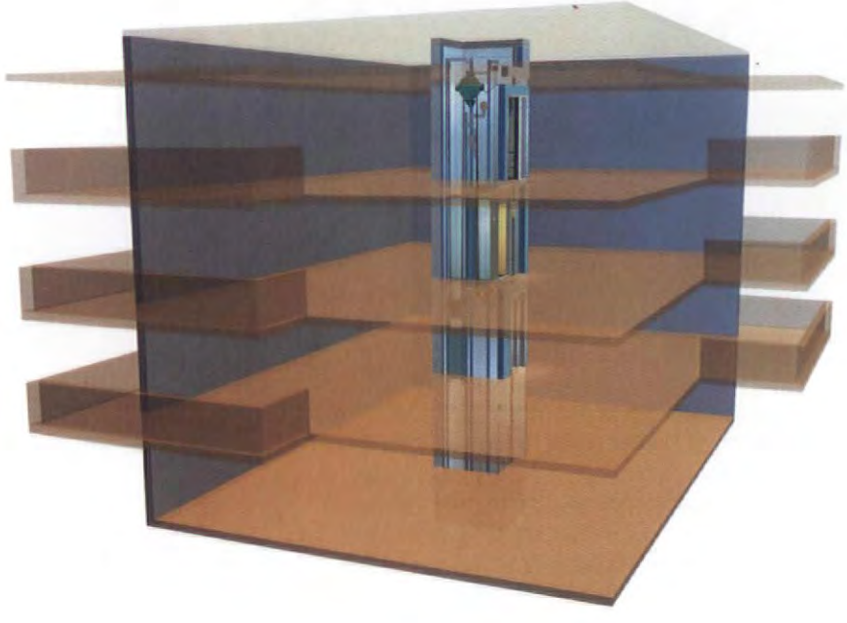
The MonoSpace concept from Kone claims to cut total elevator construction costs by up to 15 percent. Aimed at both new and existing buildings, and initially available to the European market, MonoSpace eliminates the need for a separate machine room, thereby maximising rentable space and cutting construction costs.

The secret is a new type of gearless hoisting machine called EcoDisc which is compact enough to be incorporated into a standard elevator shaft. The controller, also usually located in the machine room, is built into the door frame on the top landing. The motor technology behind the EcoDisc power unit is not new, having been used world-wide in industrial automation. But this is the first time it has been put to use in elevators, and it would seem to offer many advantages.

EcoDisc weighs considerably less than conventional geared traction machines, and as it is a slow-revving unit, there is no need for reduction gear. It also claims to be three times as efficient as hydraulic power units while consuming only 40 percent of the energy required by the latter. This offers the customer a considerable saving on the annual maintenance bill. And because there is no need to accommodate the machine room, the design of the building and the construction process is liberated, further cutting costs.

Since its launch last year, MonoSpace has secured regulatory approval in a number of EU countries and has been specified for several major projects. **WA**





Above *A single elevator shaft provides a "perfect build shape" to speed up construction and cut total costs by up to 15 percent.* ***Above left*** *MonoSpace is made possible by the EcoDisc, a new type of hoisting disc which is slim enough to be accommodated into the elevator shaft.* ***Left*** *The MonoSpace elevator concept enables the design of buildings needing no machine room for the hoisting system and controller*

A

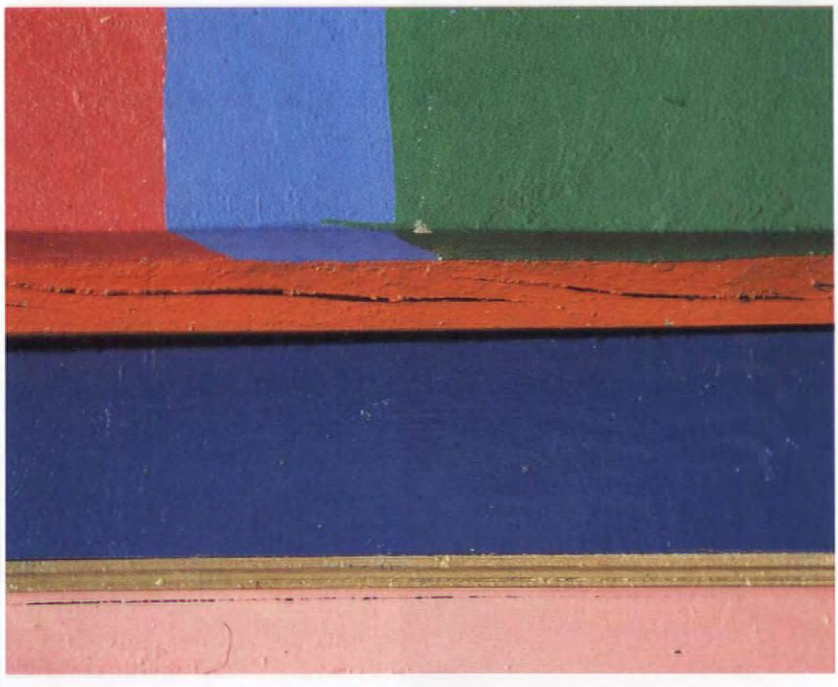
Katherine MacInnes

In his bestselling novel *One Hundred Years of Solitude* the Colombian magical realist author Gabriel García Márquez describes the adventures of the Buendías family during Colombia's 100 Year Civil War. They lived in a Conservative town where the citizens painted their houses blue. Liberals, in outlying villages, painted theirs red. The penalty for sporting the opposition's colour was death. Fact is often stranger than fiction and until recently the traditionally Liberal citizens of the Colombian hill town Ráquiria were still nervous of the colour blue. In order to erase latent suspicion, the town mayor suggested that Ráquirians should paint their houses "all the colours of the spectrum" to advertise the principles of political tolerance.

B

C

D



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In next month's World Architecture

Part of a huge housing scheme "La Contrada" on Lake Garda in Italy by Oswald Zoeggeler

Hotel Kyocera in Kagoshima, Japan, by Kisho Kurokawa

Motorola Mexico Manufacturing and Office Facility in Chihuahua, Mexico, by Heery International

BUSINESS

International news, reviews and previews.
OnScreen comes direct from Tokyo. *WA's* new *OnScreen* editor, Mark Dytham, visits Toyo Ito's office and reveals the latest in the firm's computer-related innovations.

COUNTRY FOCUS – Italy

David Lane reports from Rome on the latest news of the Italian construction industry. Four years ago the Milan judge, Antonio Di Pietro's, pledge to rid Italian politics and business of corruption resulted in the downfall of much of the building sector. Today the situation is improving, but still there is little work for architects, and the abundance of architectural services means that architectural work in Italy comes cheap. *WA* reveals why most Italian firms have no more than five architects; why most firms choose not to specialise, and why few overseas architects have any success in getting, and keeping, work in Italy. Including an interview with the one overseas architect who looks set to build in Rome, Richard Meier, plus project reviews from Northern and Southern Italy, including the work of Renzo Piano and Gregotti Associati among others.
Future Country Reports will feature Israel in April; Singapore in May and East Coast US in June.

PROFLE – Kisho Kurokawa

Spanning 35 years, Kisho Kurokawa's achievements have secured his undisputed status as one of the century's greatest architects, whose influence extends far beyond his buildings and projects. Having co-founded the Metabolist Movement in 1960, Kurokawa has evolved a mode of architectural practice in which theory and design progress iteratively – each of his numerous and substantial commissions being directly related to an evolving theoretical discourse. He has won the highest design awards, visiting professorships and honorary fellowships, and has published his work extensively. *World Architecture* reveals the man, the broad spectrum of his thoughts, and the spectacular quality of his buildings and projects.
Future Profiles will feature CY Lee (Taiwan) in April; Cannon (US) in May; Leigh & Orange (Hong Kong) in June.

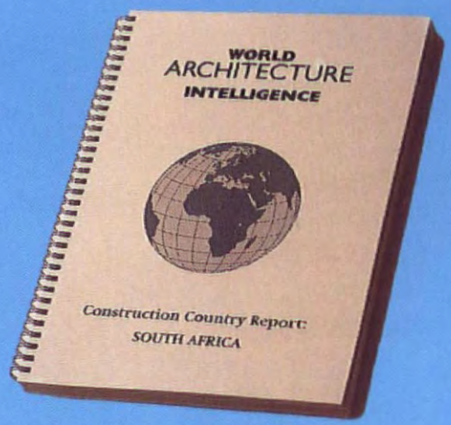
SPECIAL REPORT – Industrial architecture

Alan Philips, author of *Industrial Architecture* introduces the Special Report on industrial buildings. Philips suggests that, with the exception of the "sheds and warehouses" category, industrial architecture has the same requirement for functional specificity as other architectural sectors. "From your greatest discipline, springs your greatest freedom" – the idea that, for example, a "design and build" client with a yardstick budget will produce poor opportunities for good architecture will be argued as a myth. Projects include an exclusive preview of Nicholas Grimshaw's Dye Factory in Nottingham, UK; a Cracker Factory for Japanese clients in Australia; the Motorola Manufacturing and Office Facility in Mexico by Heery International, and Overslagstation in The Hague by Jan Brouwer Associates.
Future Special Reports will cover Museums in April, Libraries in May and a survey of the world's Top Structural Engineers in June.

PRODUCTS – Interior finishes

Luxury is back. Rich colours, exclusive materials, decorative surfaces. But with a difference. Show now has a function as part of the corporate statement, a necessary "indulgence" exactingly selected for a complex and competitive market. *Products will focus on Hard Flooring in April, External Environment in May and Architectural Hardware in June.*

Everything you need to know to do business in the Republic



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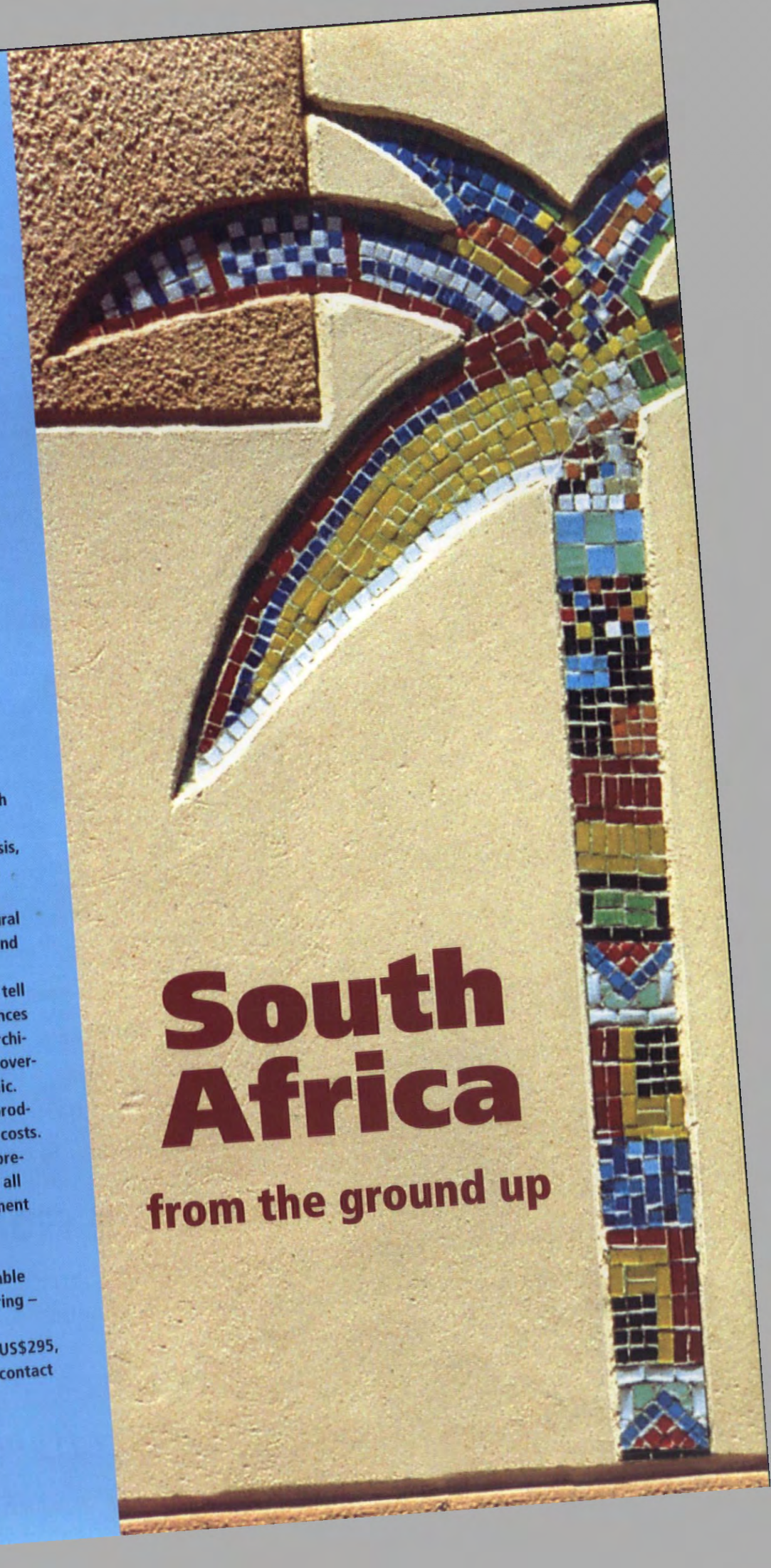

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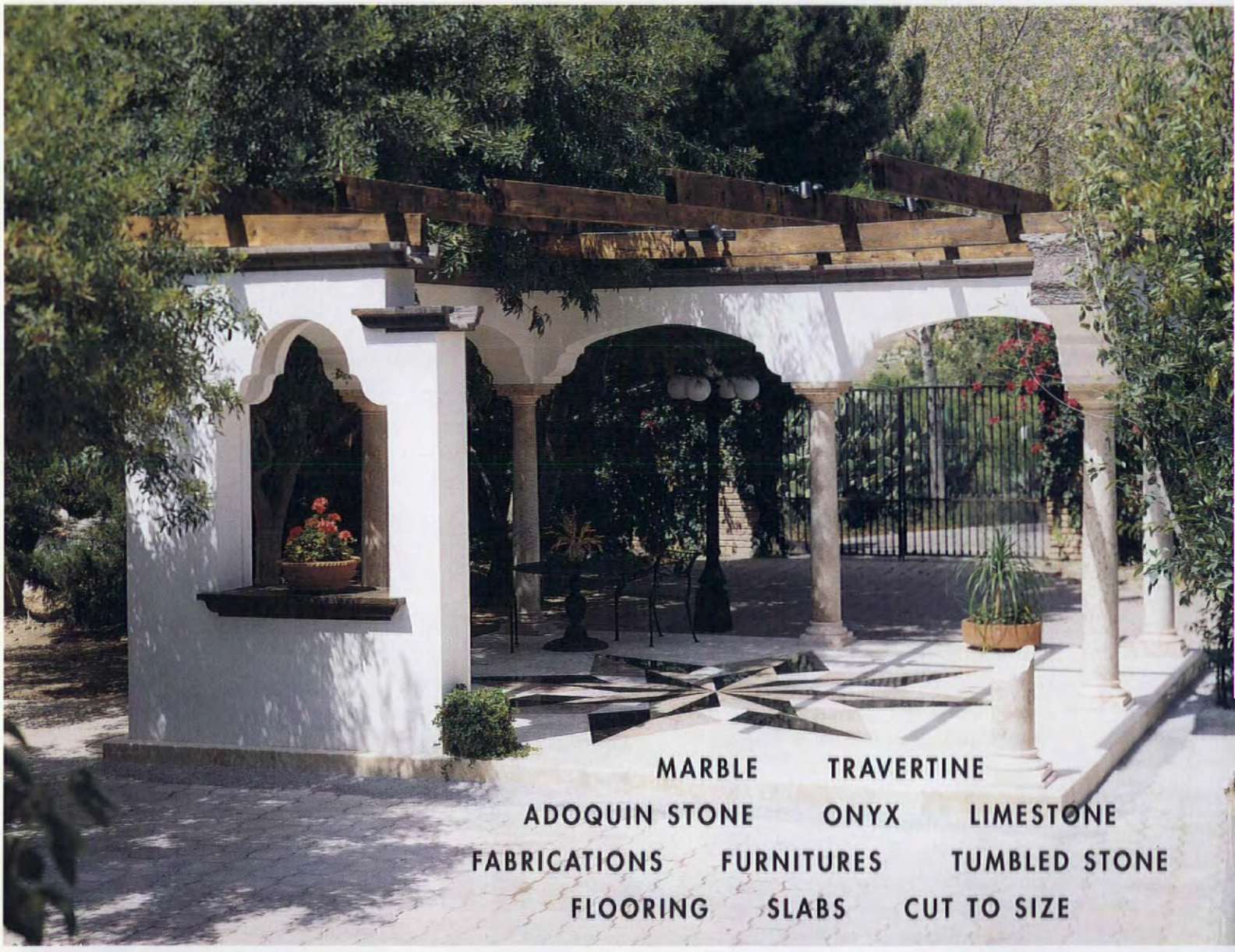

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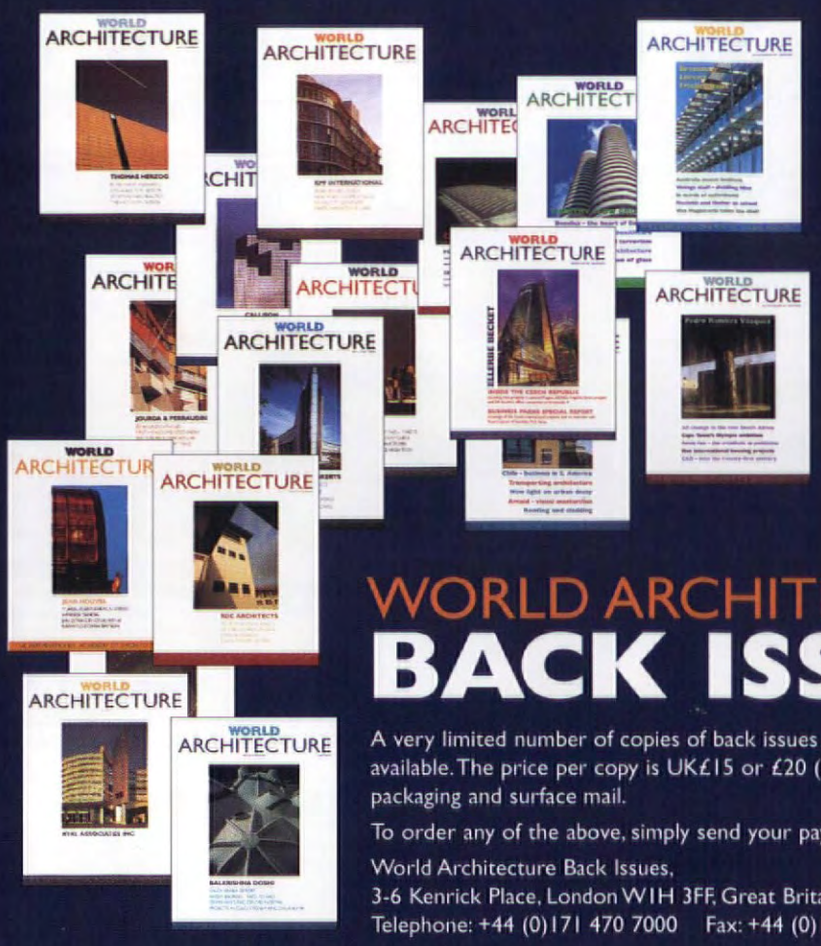

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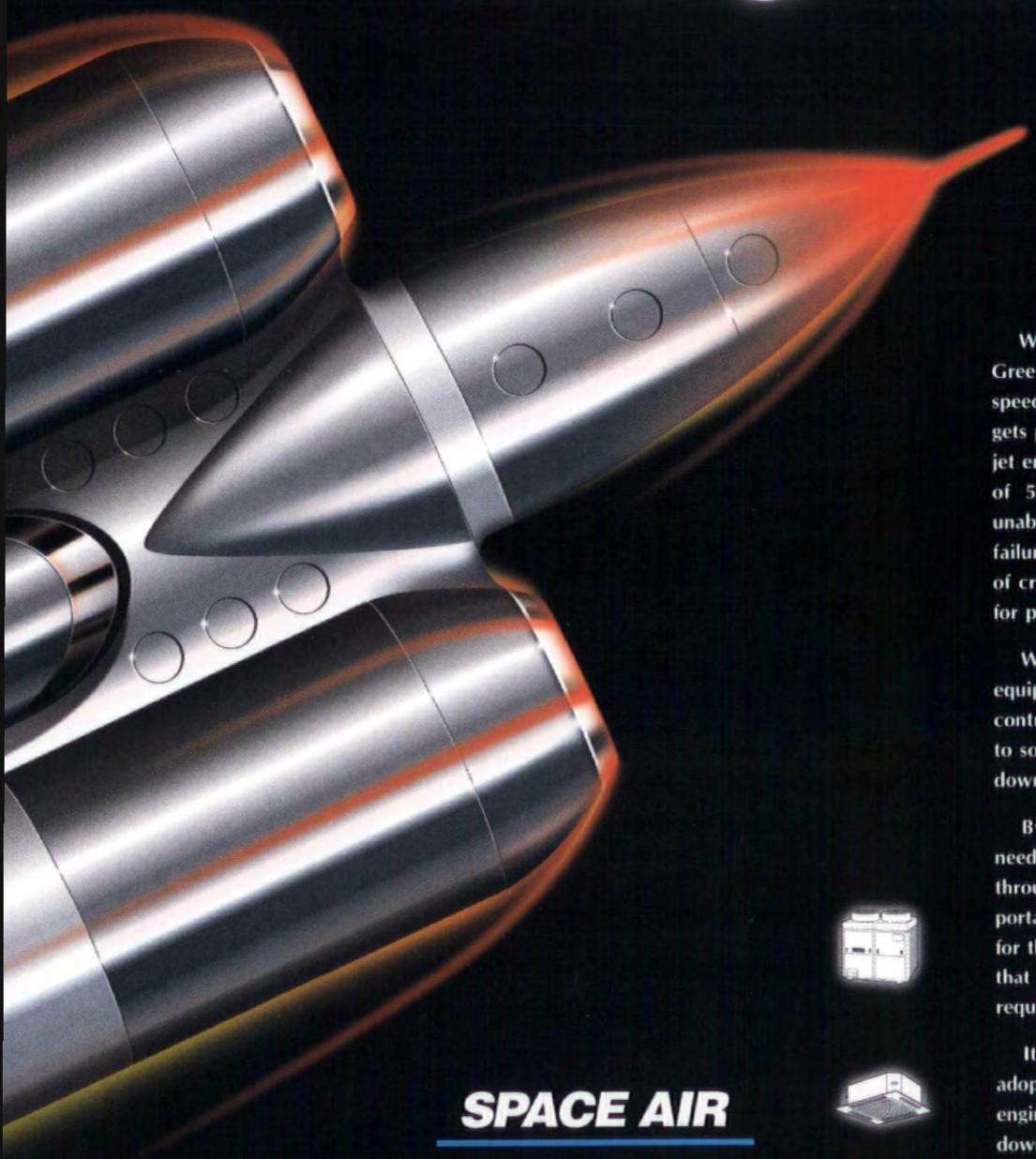

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