WORLD ARCHITECTURE

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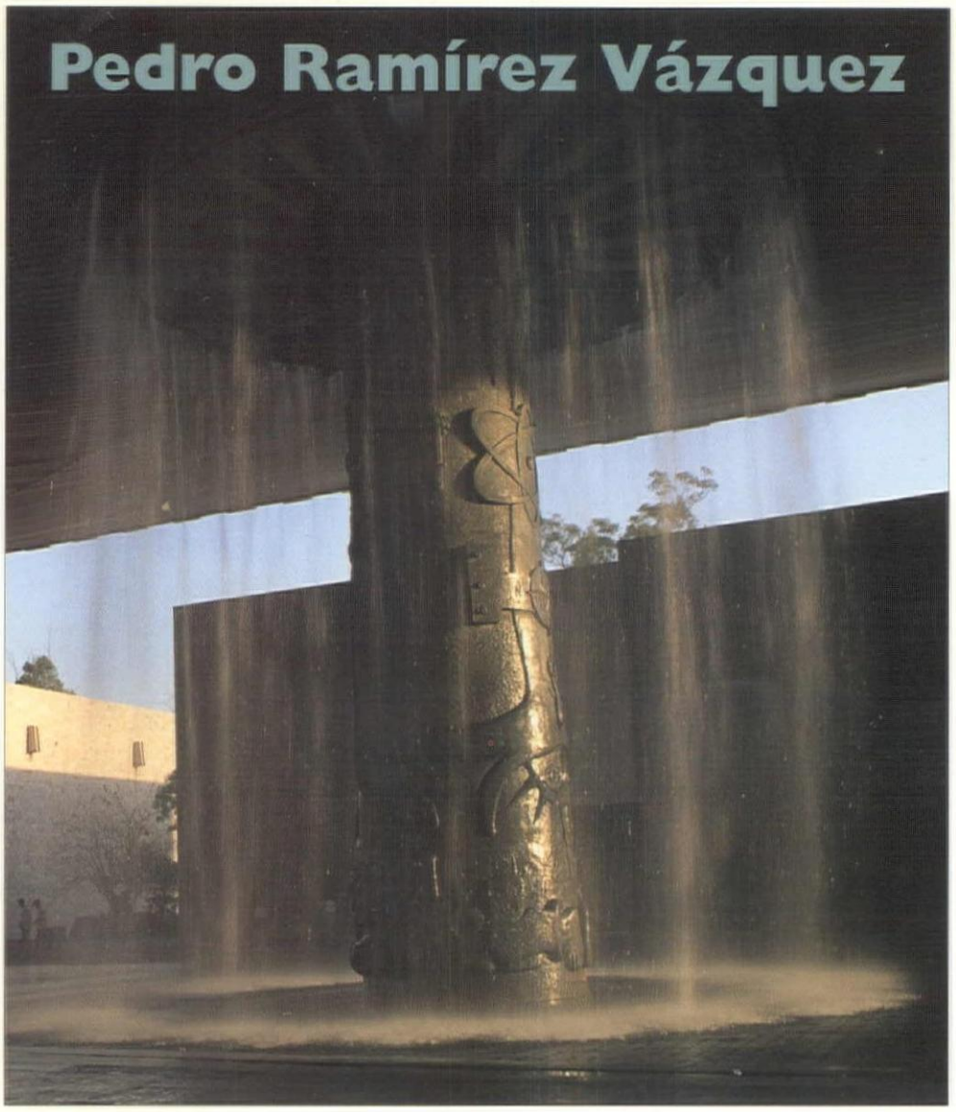


All change in the new South Africa

Cape Town's Olympic ambition

Revel Fox – the architect as politician

Five international housing projects

CAD – into the twenty-first century

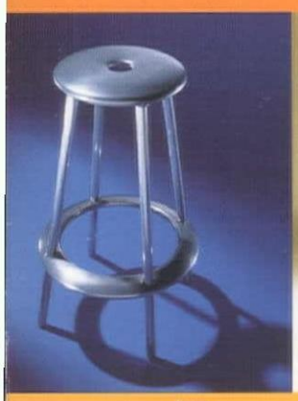
THE BUSINESS MAGAZINE FOR THE GLOBAL ARCHITECT

ALLERMUIR

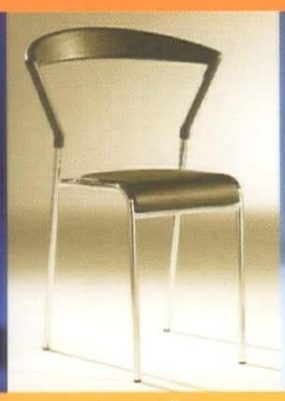
zupo

designed by john coleman

John Colemans sensuous curvilinear Zupo chair design is the second wooden chair to be produced by Allermuir. With elegant tapering curved beech legs and rails, a generous low profile upholstered seat pad, and a single curvature polished beech veneer backrest, which can also be upholstered. Zupo is available with or without armrests, offering the best in contemporary luxury and comfort as has been proven in both corporate and restaurant applications.



luna



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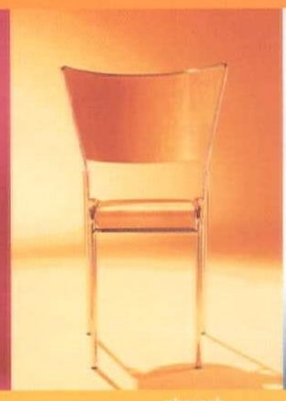
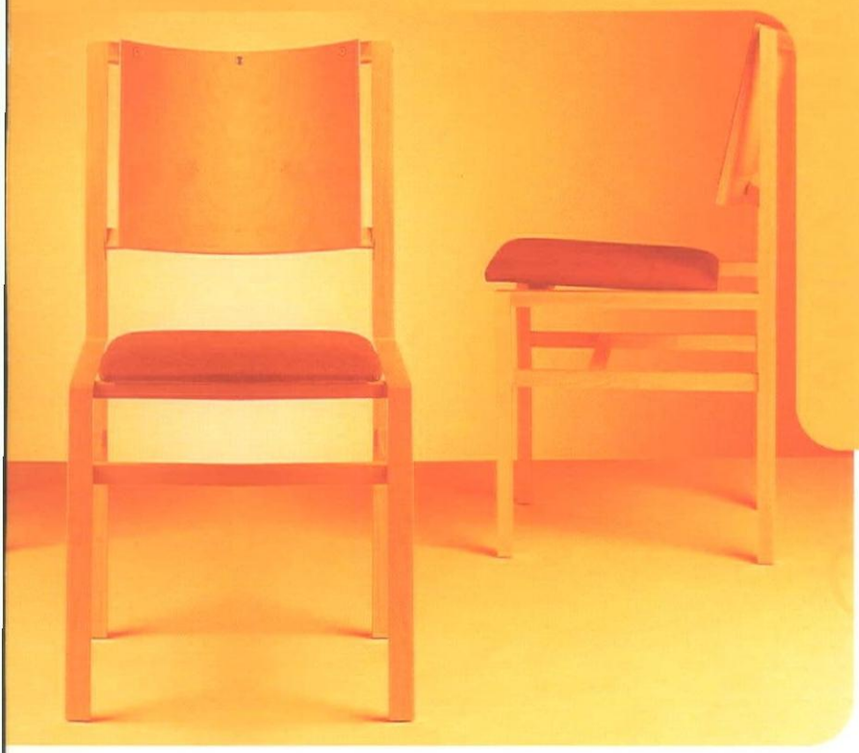


pharaoh

wafer



3°

3° Side chair designed by J Mark Gabbertas

3°, in clear lacquered maple, by J. Mark Gabbertas, represents Allermuirs first all wooden frame chair. An elegant structure, strong, beautiful, restrained and above all, extremely comfortable. Traditional wood engineering embraced by contemporary styling. Slender sections and flush joints are mirrored in the stools. Seats are upholstered, and frames are also available in stained beech. Single and double pedestal, tubular seated framed, cruciform base tables compliment this range to enrich any interior.

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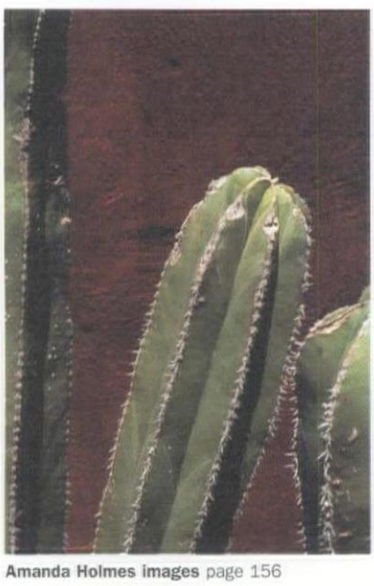

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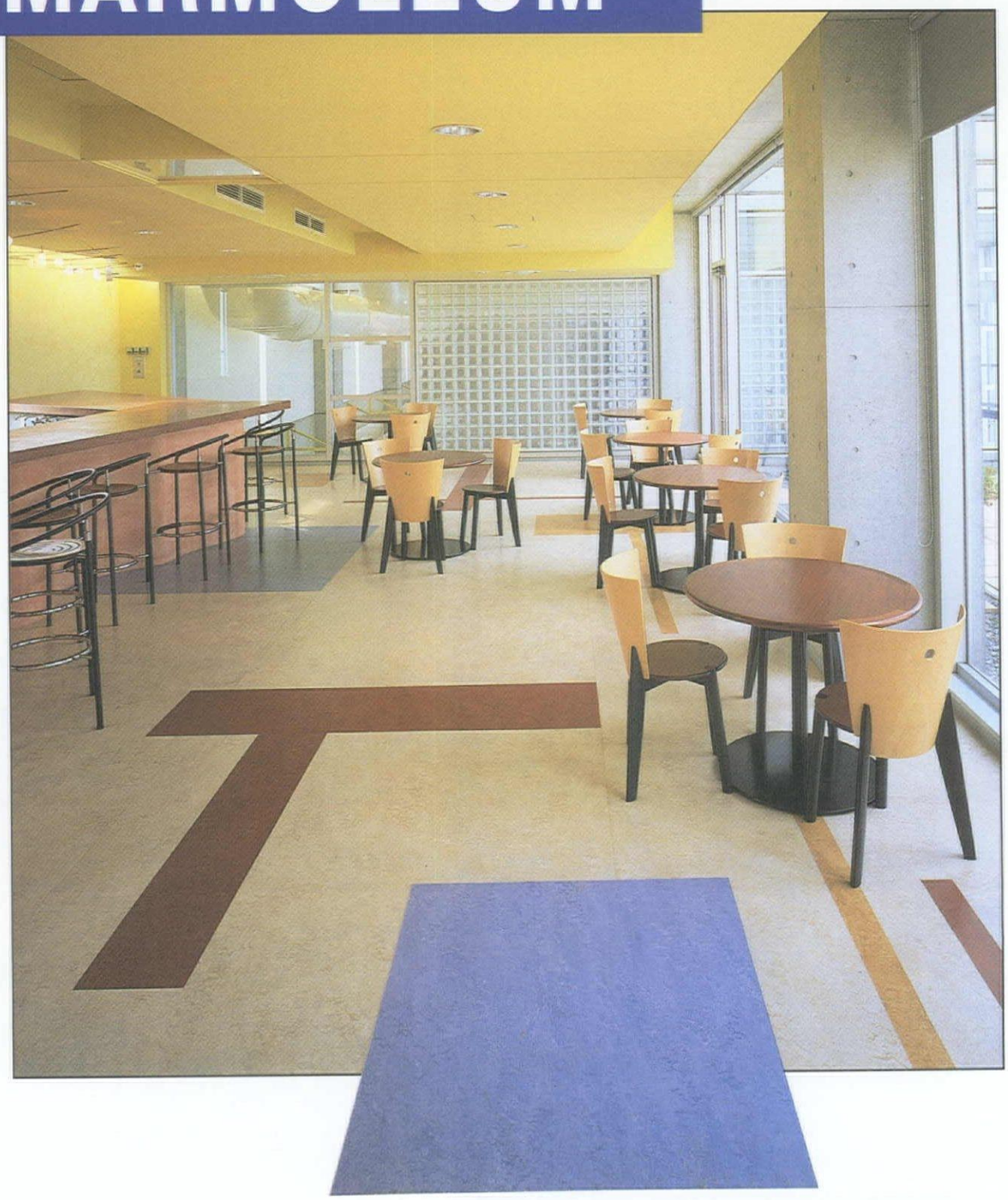

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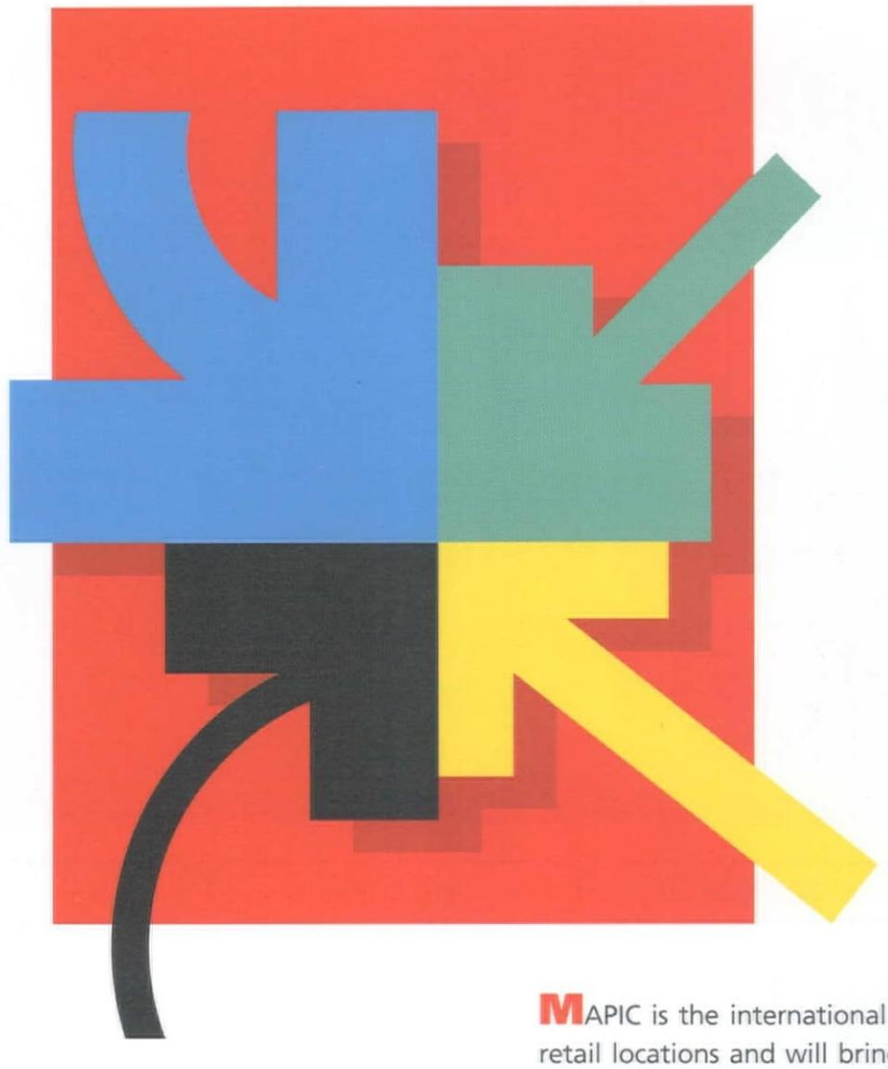

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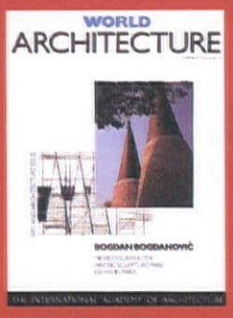

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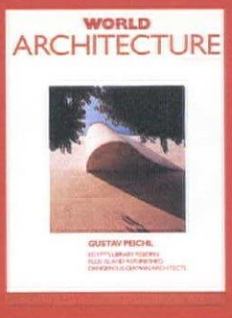

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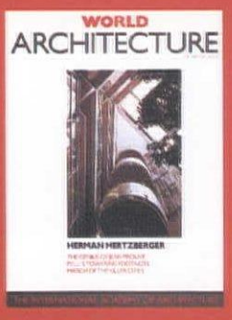

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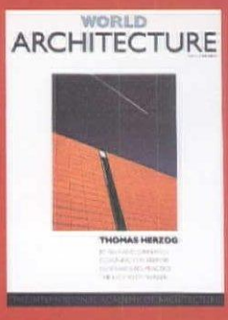

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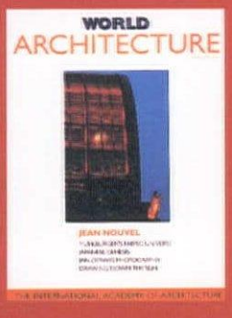

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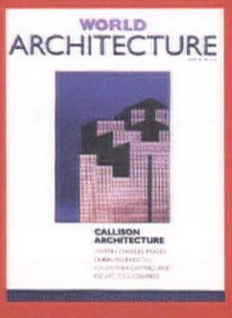

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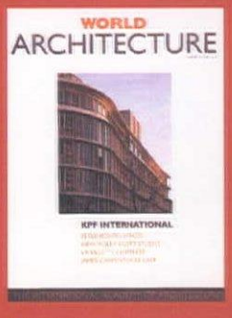

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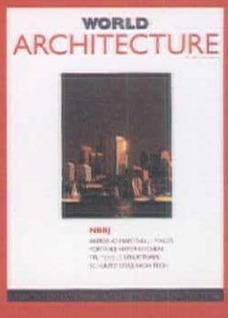

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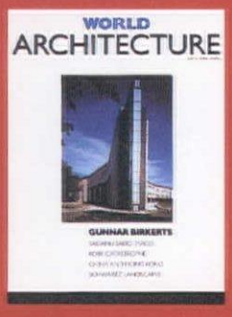

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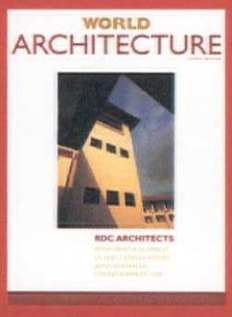

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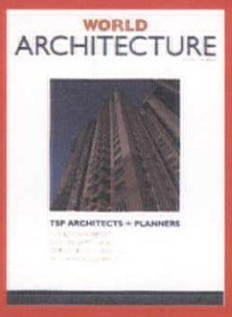

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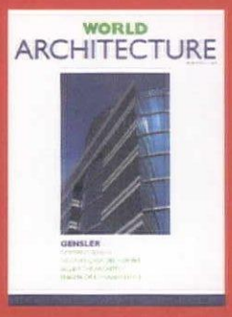

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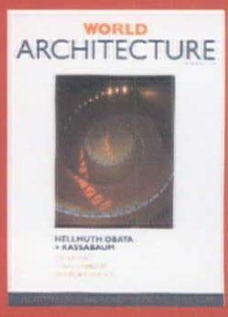

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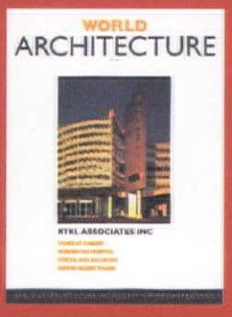

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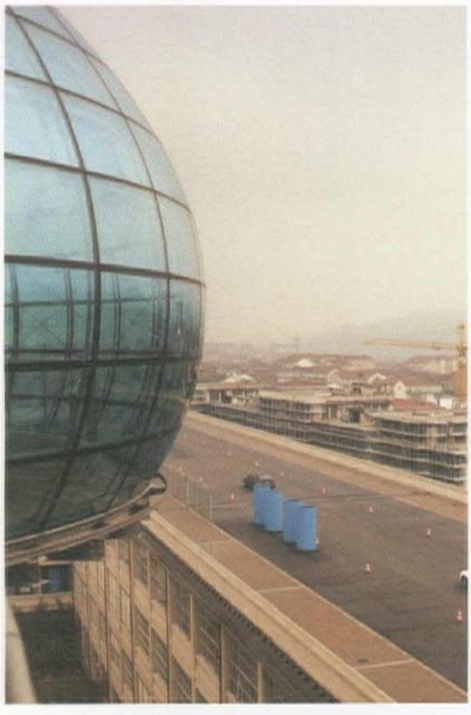

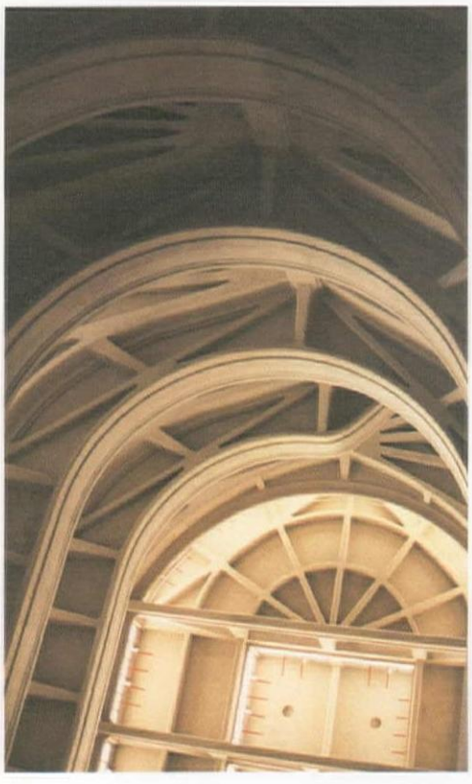

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A recent installation is the new Lingotto Centre in Turin, Italy which is undergoing a programme of refurbishment by architects Renzo Piano Building Workshop. Formerly the Fiat car factory, and known for its famous rooftop test track, the complex is being converted into a modern centre for business and the arts. Danfoss VLT® HVAC drives have been chosen to control the airflow of this vast complex which caters for up to 10,000 people at any one time.

The design of the new complex includes exhibition pavilions, a conference centre and auditoriums, as well as a hotel and residential accommodation. But Lingotto is not just an international centre. It is very much a place for the region of Turin with facilities for the university as well as shopping and offices which the citizens of the city visit on a daily basis. What was once a factory is now an integral part of the city of Turin, situated in the middle of landscaped gardens and a park. Renzo Piano has achieved this while maintaining the original structure of the Lingotto factory, once described by Le Corbusier as "... certainly one of the most impressive spectacles given by industry".

The Lingotto Centre is unique in Italy and stands out from other European conference centres as all facilities are housed in one large building. Piano describes the result of his design as "a real functioning machine, not just a box". Danfoss is proud to have made a contribution to this.

Far left: *The Fiat factory was renowned for its rooftop test track.* ***Left and below:*** *The Lingotto Centre refurbishment includes a number of different environments with various climatic demands.* ***Bottom:*** *The rooftop helipad*

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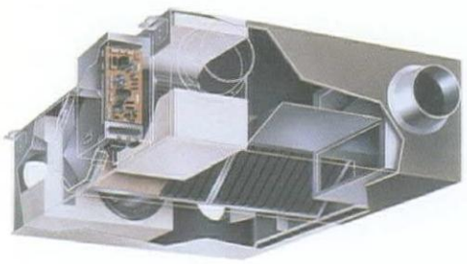
Improved Indoor Air - Hand in Hand with Energy Efficiency

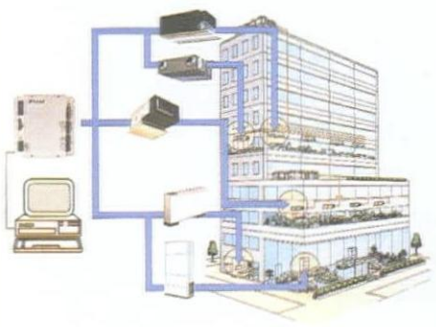
Indoor air quality is now well and truly under the spotlight and industry and governments alike have begun at last to react to the potential health problems posed by inadequate ventilation – in the UK for example, the extension of the Workplace (Health, Safety and Welfare) Regulations, 1992 to include 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.



Dailin HRV Heat Exchanger

Dailin D-BACS Control System



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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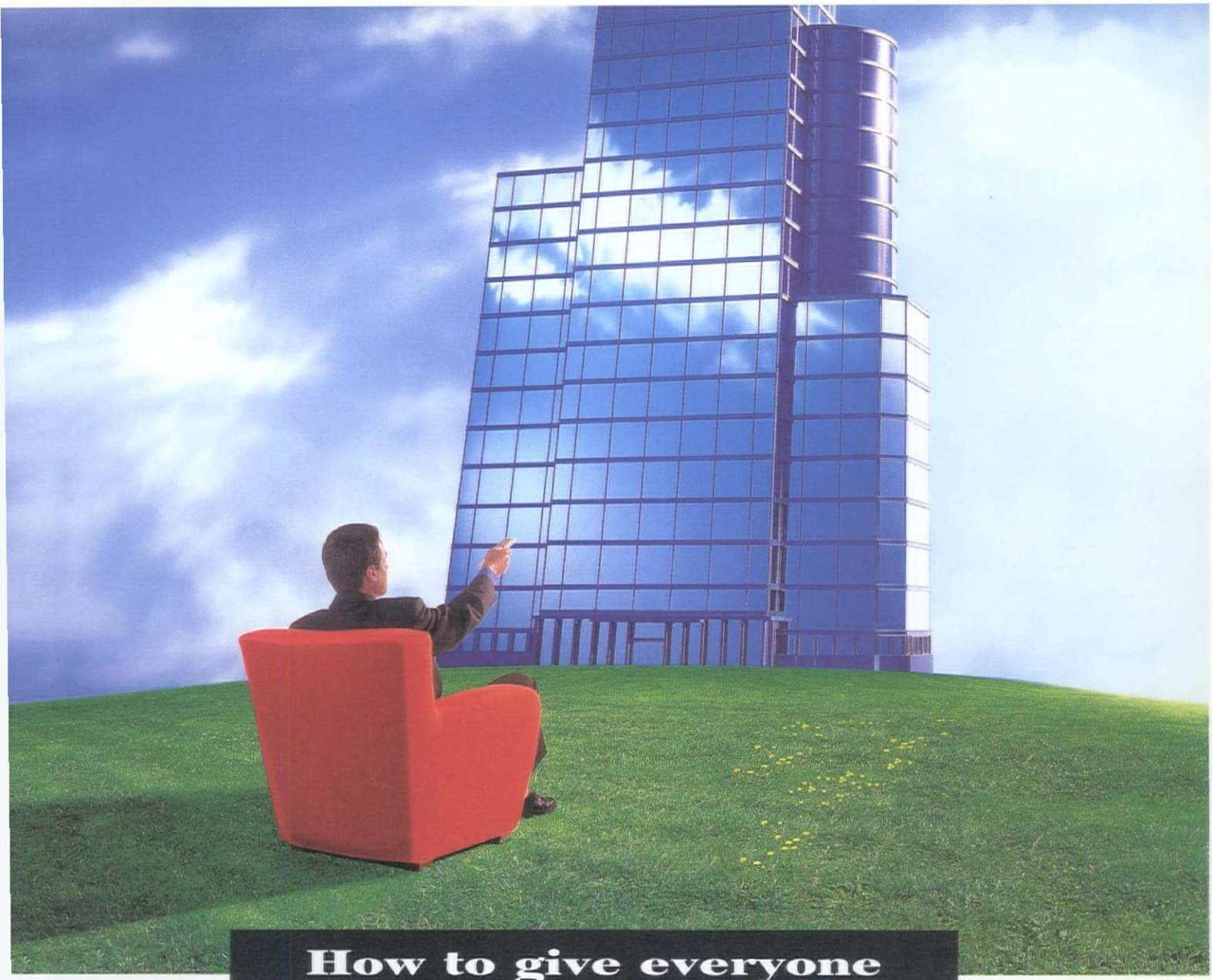

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D-Bacs - Daikin Building air conditioning control system, an integrated management, monitoring and control system for modular and central climate control. It all adds up to an efficient, intelligent air conditioning system, resulting in considerable energy savings.

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These materials have been given "anti-stain" certification by the Ceramic Centre of Bologna, which guarantees their stain resistance.

GranitiFiandre products are available in matt, "antique", semi-matt, bright and polished versions. Though each has its own identity, all GranitiFiandre materials can be mixed and matched perfectly, even selections from different collections.

Like all sector leaders, GranitiFiandre is known within the international market for its extraordinary creative and styling potential. For this reason, truly sensational products are being created which, in the case of the *Pietre Preziose* collection, are destined to open a new chapter in the history of materials for public buildings and walls.

All items from the Pietro Preziose collection can be matched with each other or with other GranitiFiandre collections, and embody the technico-aesthetic features of marble and natural granites.

This collection is an association of elements which do not occur together in nature i.e., the polychrome colouring, three-dimensionality, rich veining, brilliance and continuity of the product.

Evolving from the typology and aesthetics of the Pietre Preziose of which they are a part, another new addition is the *Onici Rari*, materials that create a very impressive impact thanks to the deep and transparent veining and the precious metals used. Such an effect is only rarely found in nature, and is absolutely inimitable.

GranitiReali materials represent the most faithful interpretation of the rarest and finest natural granite. This collection is the result of in-depth research on the shape of the grains and the colours of natural granite, as well as state-of-the-art technology that enables the colour shades to meld together to create special effects with compact grains.

The *Pietro Preziose* and *GranitiReali* collections are made up of absolutely innovative materials which, thanks to their exceptional characteristics are guaranteed for a century.

With its new proposal of *"Tarsie ed Ornamenti Preziosi"* (Precious Inlays and Ornaments), also guaranteed for a century, Graniti Fiandre presents very refined patterns and designs formed with materials of the Pietre Preziose and GranitiReali collections that facilitate the creation of exclusive environments to great effect.

GranitiFiandre products have gained recognition all over the world. Recent projects in which they have been used include: the NASA Center in Clear Lake City, the Hotel Pariz in Prague, the Coca Cola office building in Antwerp, the Banco San Geminiano e San Propsero of Modena, the Headquarters of IBM in Adelaide, the TGV railway station of Paris-Massy, the Bugatti Automobiles in Modena, the "Finnpap" Offices in Moscow and a building for the Ferrari dealer of Wiesbaden.

GranitiFiandre has introduced an extract from its general catalogue on to the Internet. http://www.italia.com/fiandre

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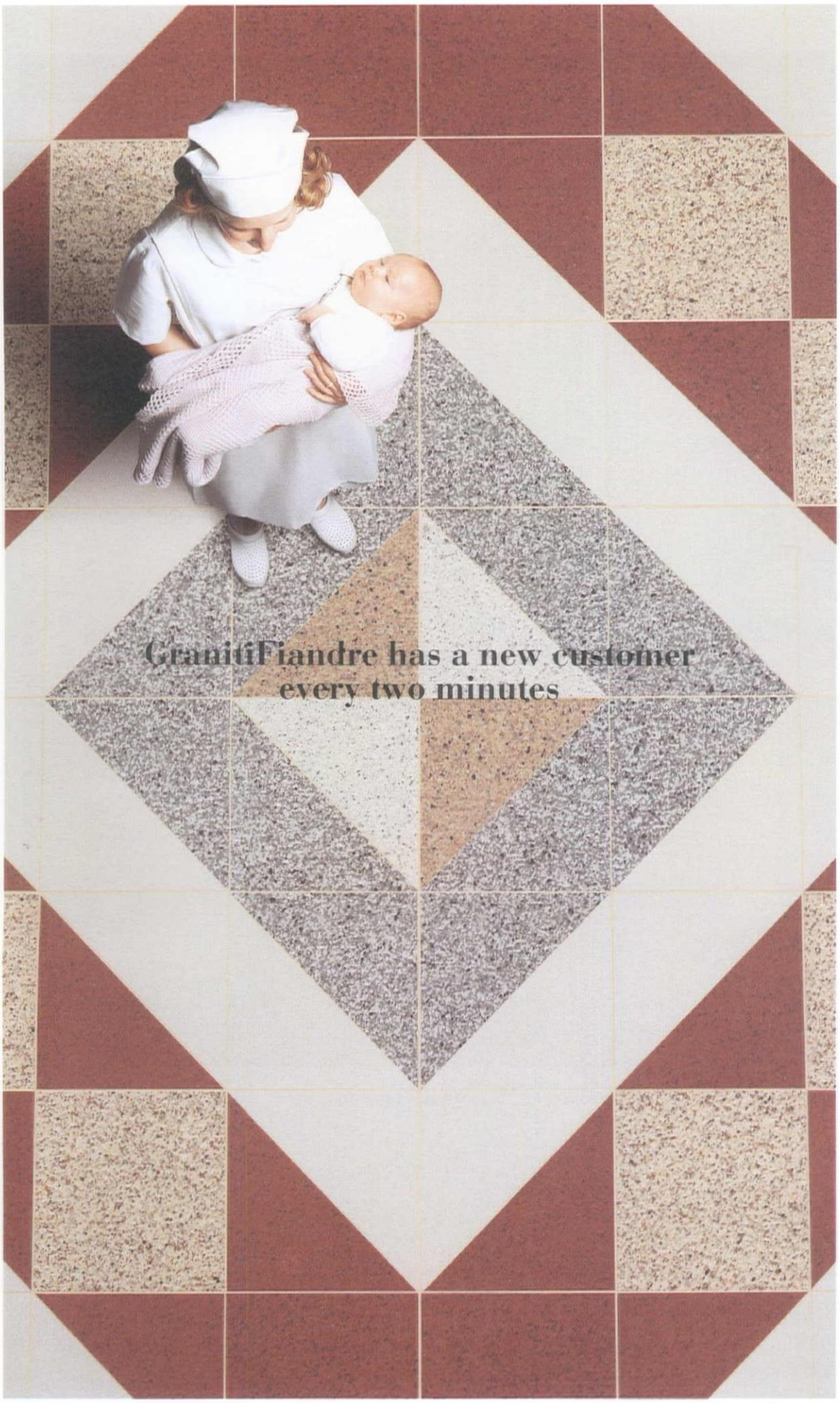

Every two minutes, all over the world, there is an architect or a planner who is confirming his preference for **GranitiFiandre** porcelain stoneware: certainly for its exceptional values of hardness, non-absorbency, resistance to frost, wear and chemical attack, but just as much for its extremely special aesthetics and not least of all because it is **guaranteed for a century by GranitiFiandre**, the leader company which holds the Quality System certificate from the **UNI EN 29001/ISO 9001** norms.

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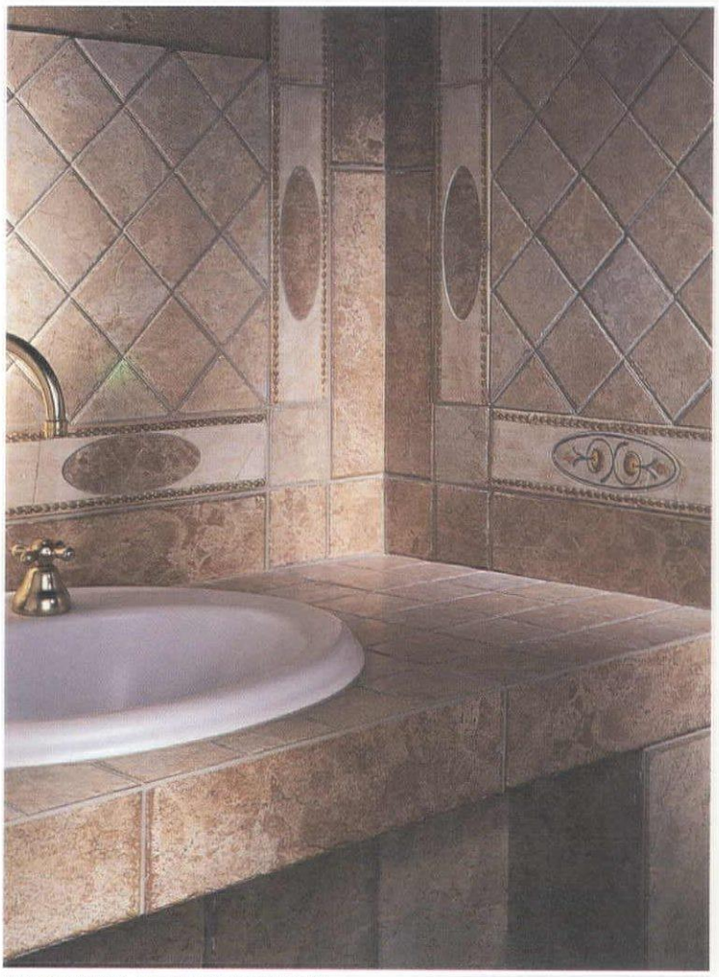

RIVESTIMENTO: FONDO: VERDEGAIO 10
DECORI: MORELLO LISTELLO, LISTA FEMMINA, LISTA DELLA ROBBIA

Florence and the Renaissance

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

FIRENZE and other Pastorelli Ceramiche tile products have ben installed worldwide. Some recent projects are:
The Hyatt Hotel, Miami, USA
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The Assembly Hall, Yangon, Burma
"La Residence" Hotel, Port Louis, Mauritius

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The development of decorative wall paints and of non-toxic polychromatic water-based products have always been the goals of OIKOS. For many years, day after day, OIKOS have been working for the future of water-based decorative paints with full respect for humankind and for the environment. OIKOS have recently been involved in some notable projects, including two hotels in Israel.

The four-star Royal Beach Hotel, Eilat is composed of 13 storeys (500 rooms) and a huge ground floor with a view to the large interior garden, containing four swimming pools.

The hotel is a prime example of architectural decorations used as creative solutions. There are two large salt pools with waterfalls of 60 centimetres, and two smaller fresh water waterfalls. All are surrounded by high palm trees in a terraced garden.

Located next to the beach the hotel garden fronts onto the bay, thus acting as a green oasis for the hotel guests.

Both the garden and the pool are illuminated in the evening creating a romantic atmosphere.

The decorators took special care with the interiors. The stylish, high quality OIKOS water-based paints, from Italy, were chosen for the hotel's public spaces as well as the guestrooms. The spectacular five metre high lobby, and the corridors, are decorated in a goldish-beige OIKOS Multidecor paint, a subtle finish providing an impressive welcome to guests. A special application technique, Alonato, was used to create light and dark opaques and spots of gold coloration.

The guestrooms were decorated with the silk-effect, water-based Pallas, from OIKOS, in a beige tone in order to create an air of luxury and opulence.

The entire hotel complex – approximately 15,000 square metres – was painted with OIKOS products.

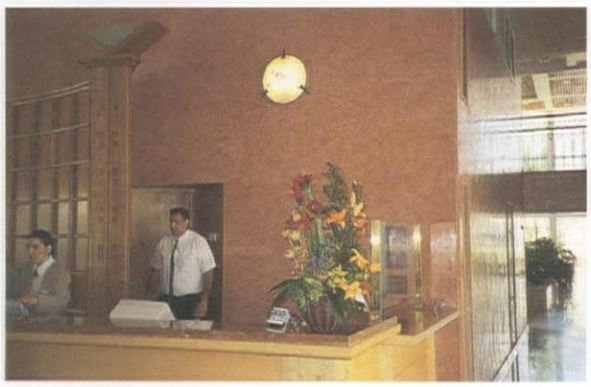
The Red Sea Paradise, another four-star hotel also located in Eilat, occupies 25 donam in the northern area of the city. It is composed of 280 rooms over two floors with a lobby looking over a large interior garden.

The hotel is an example of a project in which the geographical location inspired the architects to reach a creative solution. Despite the fact that views of the bay from the hotel are obstructed by tall buildings in the locality, and salt pools located near to the hotel are unsightly, the architects managed to create an attractive hotel.

The architects, Mr Faigin Yehoda and Mr Zis Rani, acknowledged that these were the major problems, added to local planning restrictions prohibiting them from building a tall structure. The biggest advantage of the site was its large surface area.

The name of the hotel inspired the architects' concept of an interior garden which will, it is hoped, provide visual relief to hotel visitors. The garden itself has multiple elements providing a rich source of interest to onlookers.

The different areas of the hotel are connected by column-lined bridges. The design intention was to create a linear patio.



Far left: *Reception desk of the Royal Beach Hotel showing Multidecor paint applied with the Alonato technique.* ***Clockwise from top left:*** *A closer view of the Multidecor paint used in the Royal Beach Hotel; Reception area of the Red Sea Paradise Hotel decorated with the terracotta stucco finish; The elevator lobby of the Red Sea Paradise Hotel has the Raffaello finish in a light salmon colour; Red Sea Paradise Hotel's reception desk showing the Raffaello stucco more clearly*

The interior garden, the tropical core of the hotel, occupies about half of the hotel area and was designed by Mr Fux Ivan and Mr Levin Brus. They had to contend with a divided area which was part of the hotel terrain. Their solution was to create three waterpools. Water from the two pools situated on the upper level, flows into the pool on the lower level and then through 60 centimetre waterfalls to the main bathing pool. Large leaved plants were used to give the impression of a tropical garden.

Levin points out two major innovations in the design of the garden. The first was the use of Australian coconut trees – the first hotel in Israel to use this species of tree and not the usual Israeli date palms – the second was the construction of artificial rocks. The rocks were built by an Israeli company who managed to attain a high level of quality and performance. Another element in the garden is the circular mosaic, decorated in reddish-brown colours and deep blue stones.

Simplicity is a principle feature of the hotel environs. Large palms, night illumination, fences and balconies combine to create a tranquil, Mediterranean atmosphere.

Mr Yair, Mrs. Neomi Faran and Mr. Noy Arie were interior designers for the project, responsible for the interior decoration of the entire hotel, including the guestrooms and the public spaces.

The natural colours of the Red Sea region, such as red and blue, were the dominant colours chosen from the OIKOS colourcharts. The choices were made in order for the walls to coordinate with the upholstery of the chairs, the glass of the counters, and the blue of the large dome in the lobby.

The decorators took special care with the interiors, chosing the quality and Italian style of the OIKOS range of water-based paints for the public spaces and the guestrooms. The entrance and the corridors were decorated in a terracotta stucco, creating a warm, luxurious welcome for the guests. This colour was chosen to coordinate with the rest of the decorations in the lobby.

The guestrooms are decorated with a silky-effect waterbased paint, Pallas, from OIKOS, in a beige colour in order to create a warm relaxing atmosphere.

The decorators intended to minimise the distinction between the interior and exterior. It was therefore decided to have identical tiling in the entrance and large glass walls built so that natural light and scenery can be seen from the interior. Some say that since going on holiday is synonymous with comfort and relaxation the design fits the visitors requirements, but others may say that it is an artificial scenery which has no dialogue with the surroundings.

OIKOS today is the market leader in decorative paints. They export to 55 countries all over the world and have been used in the biggest and most prestigious projects such as : airports, shopping centres, hotels, residences, restaurants, stations, hospitals and other public places.

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Getting down to business

Can business be taught in architecture schools? Probably the most fashionable whinge from architects in the rapidly developing Pacific Rim is that the architects they are inheriting from the schools in the developed world (by this they invariably mean London's Architectural Association, or Bartlett School, MIT or Harvard in the US, or Australia's University of Sydney), are not adequately trained in the "three-pronged approach". These three essential disciplines are outlined as design, technical expertise and business acumen. Admittedly the complaint varies depending on the school in question. An example of this is two partners in a Malaysian firm who admitted that their training at the AA had left them wanting in the business department, whereas their colleagues from MIT were more streetwise. But the thrust of the argument remains the same. Graduates, when they join these mega-bucks, mega-stress firms still come down to earth with a bump when they are faced with real-life situations involving budget and time restrictions, politics and competition. While it is easy to understand the frustration of these over-worked and under-staffed firms the question inevitably turns to how the schools can accommodate their urgent requirement for young architects with a head for business.

There is a limit to how much can be squeezed into an architectural student's training, even if it does stretch in some cases to a seemingly interminable seven years. It is the one time in an architect's life when he or she can indulge in the pleasure of building for its own sake – to concentrate on the finer aspects of design and detailing so sadly lacking from much of today's off-the-peg architecture. Where the big firms are right to be concerned is if this concentration on the specific ultimately prevents the new recruit from viewing a commission in its wider context – where the architectural process of planning with regard to climate and cultural context becomes clouded by the aesthetic concerns of the individual designer.

This is the issue that is having the most direct effect on the cities of the developing world, more than the lack of business training which is inevitably learned the hard way. What cities such as Hong Kong, Singapore and Kuala Lumpur are suffering from more directly, and with more severe consequences in the long term, is a lack of long-term planning brought about by the desire to build fast and build big. This, it might be said, is not so much a matter for schools of architecture, but one for the politicians and urban planners. More often than not architects can only take responsibility for the site they are given.

Nicola Turner.

In next month's World Architecture

Ken Yeang's Menara Budaya in Kuala Lumpur, with Cesar Pelli's Petronas Towers

Schleswig-Holstein Centre, Neumünster, Germany by Architekturbüro WGK

Sheraton Hotel, Charles de Gaulle Airport

BUSINESS

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

COUNTRY FOCUS – Malaysia

In the frantic lead up to the 1998 Commonwealth Games to be held in Kuala Lumpur *World Architecture* points the spotlight on the leading architectural firms and charts the progress of one of the world's fastest growing capital cities whose projects include Cesar Pelli's record breaking Petronas Towers, Kisho Kurokawa's new international airport, and designs for a new "Linear City". Projects included in the report are TR Hamzah & Yeang's Central Plaza, CSL Associates/Arkitek Istibina's 300-bed Awana Hotel in Terrenganu and Group Design Partnership's showroom and offices for the national car manufacturer, Proton. Plus an interview with Peter Verity of international architecture group NFA, who have worked in Malaysia for more than a decade.
The World Survey of the Top 250 Architects will take the place of the Country Report in December/January, followed by Mexico in February, and Italy in March.

PROFILE - Architekturbüro WGK

Based in Hamburg, and with the benefit of over 50 years of experience WGK have a portfolio stretching from public housing and hospitals to government offices. Their work has been called "relationship architecture". That is to say; WGK have the know-how and versatility to approach any type of brief – generally large institutional projects – with equal confidence. With a design approach rooted in Germany's post-war industrial culture WGK's success has come through building up strong working relationships with the client before work is begun.

SPECIAL REPORT - Hotels

What makes a successful hotel? *World Architecture* examines the relationship between entrepreneurial hoteliers and the designers they choose to realise their dreams. Which will serve the market of tomorrow: large hotel chains or independent "boutique hotels"? Will businessmen or tourists provide the largest clientelle? The report includes a case study interview with the New York based hotelier Ian Schrager and his designer, Philippe Starck with a look at the fruits of their collaboration in the USA: the Delano and Mondrian. This is set against a spectrum of interpretations of the hotel from Kisho Kurokawa's eliptical hotel in Japan to Anouska Hempel's latest "boutique" design for "The Hempel" in London. World leaders in hotel design, Honolulu-based Wimberly Allison Tong & Goo are also interviewed – including images from their recent "Hotel of the Future" competition, held to celebrate 50 years of hotel design.
Further Special Reports will cover office design in December/January; bridges in February and industrial buildings in March.

PRODUCTS - Bathrooms and sanitory fittings

As Alexander Kira's book, "The Bathroom" goes into its third edition, Tim Ostler discusses the history and ergonomics of the bathroom with the bathroom guru himself.
In subsequent issues, Products will focus on the office environment in December/January; building services in February and interior finishes in March.

News Review

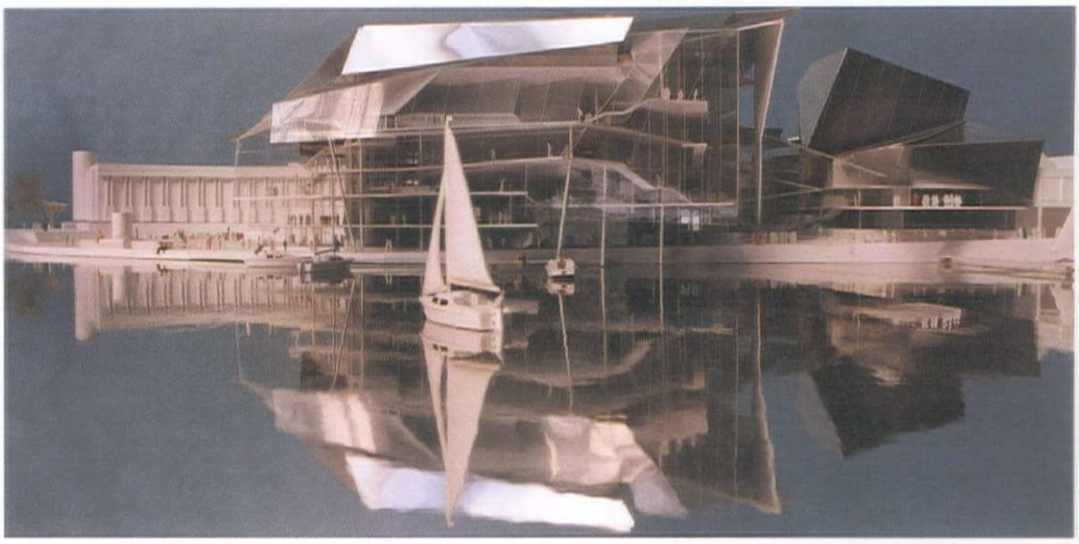
WA's News and Business round-up

Foster in France and Frankfurt

A limited competition for the design of the giant Grand Viaduc de Millau in southern France, has been won by the team of architects, Foster and Partners, and French engineers Sogelerg, EEG and SERF, with a design for a multi-span cable-stayed structure in seven sections, each spanning 350 metres. The columns range in height from 75 metres to 235 metres. In one place over the River Tarn the road deck will be 275 metres above the water, higher than the Foster-designed Commerzbank Tower in Frankfurt, the tallest building in Europe. The Commerzbank, a 62 storey/300 metre tall tower, which included Ove Arup & Partners as structural engineers, and Frankfurt practice Krebs und Kiefer, was "topped out" on 24 August.

The viaduct is pictured in OnScreen in this issue, and the Commerzbank is featured as a project within the Products' pages.

Behnisch wins £98m arts centre



Zaha Hadid's project for Cardiff Bay and Daniel Libeskind's designs for the Boiler House at the V&A Museum in London have both had their share of the headlines over the last year. Now it is the turn of competition-winning Stuttgart-based Behnisch & Partner to make their mark on the British arts scene. Bristol are planning a £98 million (US$147) performing arts centre on the city's waterfront – the region's first purpose built centre of its kind, and so far, unlike Libeskind's V&A, the public response to the Behnisch scheme has been positive. Unlike Cardiff Bay the project also has a head-start with funding. £75 million is being sought from the UK's Arts Council, and Bristol city council is donating the site with a land value of £18 million and intends to provide over £1 million annual revenue support, leaving a mere £7 million to be raised if the Arts Council bid is successful. The council's decision will be made in spring '97.

Piers 92 & 94 New York City, USA, designed by ID8/RTKL Associates Inc.

RTKL projects strike gold

The entertainment centre at Irvine Spectrum, Irvine, California won "Best Speciality Project" and the Pattaya Festival Centre, "Best Commercial Project, Retail" at the 38th annual Pacific Coast Builders' Conference. The success of the Entertainment Centre has been attributed to location, demographics, tenant mix and thematic architecture. The cinema is one of the top producers in the nation and restaurant revenues average 30 percent above projections. In the first year over five million people visited the Moroccan themed centre with its lifestyle-oriented retailers, 50,000 square foot of restaruants and 6,400-seat, 21-screen cinema. The Pattaya Festival Centre, located on the Bay of Thailand, is an open-air speciality retail/entertainment centre designed to cater for the country's rapidly expanding tourist population. Themed around the Thai culture, its folktakes and its festivals, the 200,000-square-foot-centre opened in Autumn 1995.

RTKL is expanding ID8 Division, the first thematic imaging and entertainment design division to work on these projects.

News Analysis

- NFA breaks new ground for Malaysian planning.
- Drop-out rate for Germany's architectural students nears 45%.
- Vancouver's track record improved by Asian investment.
- How and why have the Church of Rome commissioned Meier for Church of the Year 2000?
- Creating "Holy War Construction".

OnScreen

- Has Foster's bridge design been misrepresented?
- US$250 billion in cyberspace.
- Innovations in CAD (analysed further in *WA*'s Products).

Polemic

Martin Pawley on the inevitable downsizing of global firms. How soon will it be before they disperse their financial interests in small consultancies?

Modernisation of German railway stations

by Layla Dawson, Germany correspondent

Heinz Dürr, chairman of Bahn AG has announced a several billion deutschmark investment programme called "A Vision for Cities and Railway Stations". Starting with Stuttgart, where von Gerken, Marg + Partners have already completed a project plan, a further 25 main city stations are to be modernised, including Saarbrücken, Neu-Ulm, Frankfurt-am-Main, München and Nürnberg, over a period of several decades. Tracks are to be buried in tunnels, as in the Stuttgart "Programme 21" project, in order to release 1,600 hectares more city centre building land (100 hectares alone in Stuttgart) and the terminals themselves reorganised for better connections between local, national and European networks under the same roof. Vast new station halls will become service and shopping centres, office and transport nodes. The new designs hope to reduce criminality around the present big city stations which have become known as drug dealing and prostitution centres, and pitiful gathering points for beggars, runaway children and the homeless. Whether new parks and mixed developments can eradicate growing poverty is questionable. Stuttgart forecasts more than 24,000 new long term workplaces as a result of "Programme 21" with a 50 percent increase in long distance routes and 80 percent increase in regional routes on offer. With an airport connection included, five million car drivers, according to Professor Hans Sommer, chairman of "DB Projekt GmbH Stuttgart 21" are expected to opt for the greener alternative. Stuttgart's reshaping, it is estimated, will cost five billion DM, partly offset by the sale of the newly created land over the tracks. Building begins in 1999. Plans for Frankfurt am Main have also been announced with a landscaped area as big as New York Central Park envisaged in "The German Railway's Model Project for City Development in the Post Industrial Age". Frankfurt's station hall has been placed under a conservation order but beneath it a totally new transport junction is planned to replace the present shabby, badly lit and depressing warren of halls and corridors. In all the new projects, goods and marshalling yards will disappear out of cities to be replaced with modern facilities nearer production zones. Similarly in Leipzig a separate programme of modernisation by investors BME (Bahnhof Management und Entwicklungsgesellschaft) mbH, a partnership between Bahn AG, a Hamburg shopping centre group and a Deutsche Bank property fund, will complete its first project by the end of 1997 – transformation of the station into a 400 million DM service and shopping centre of the 30,000 square metres over three levels. BME's next plans are to tackle Köln and stations.

Gensler design broadcasting HQ

Gensler, (the US based Architecture/Design firm) is designing the broadcasting company QVC's headquarters in West Chester, Pennsylvania. The new facility is part of QVC's strategy to double in five years and maintain and improve upon an existing a corporate culture that supports their business. The headquarters project is an adaptive reuse of an existing 550,000 square foot warehouse and light industrial manufacturing facility. Gensler is designing new office space, a production studio, storage, cafeteria and studio tour component.

QVC hopes to welcome the public by: opening up the new studios to live audiences who will participate as part of the show; holding special events and celebrity signings; and offering daily tours with an opportunity for guests to meet show hosts. The tour component will include a Hall of Fame, PreFunction Area, Tour Corridor, Media Wall, "QVC: the Future, and Statistical Tour Information". A Retail Store will showcase the best of QVC products and provide a place where the public can purchase new products as well as QVC-branded merchandise.

In Brief

CHINA

Gensler in orbit

The US based Architecture/Design firm Gensler is designing 50,000 square feet of "galactic"-themed, indoor entertainment on four levels inside the landmark Oriental Pearl TV Tower in Pudong, Shanghai. Shanghai Space City includes an Iwerks ride simulation theatre, a Vekoma indoor rollercoaster, two interfloor slides by ProSlide, a "Mystery Spaceship" attraction designed by Gensler and Lexington Scenic of Los Angeles, two Megazone laser tag games, a food court and retail kiosks. The primary client is Charles Liu, a local developer; the site which currently only features an observation deck attracts approximately 10,000 daily visitors.

UIA 1999

The next UIA Congress will take place in Beijing (People's Republic of China) in 1999. Berlin (Federal Republic of Germany); the group of Palladian cities (Venice, Padua, Vicence, Treviso and Abano with Florence (Italy) and Jerusalem (Israel) submitted requests to host the 2002 Congress. Berlin obtained a majority with 137 votes since by 2002, the majority of constructions will be completed and the city will provide an excellent framework for limitless dialogue on the future of big cities.

MALTA

Luxury living

The £18 m (US$27m) new five-star hotel Corinthia San Gorg Hotel, has been officially opened. The hotel, which sits on a peninsula overlooking St George's Bay, was designed by Dry Butlin Bicknell. A local Maltese architect was responsible for the shell, says DBB project director, George Butlin, but the London based Dry Butlin Bicknell was bought in early enough to restructure the inside. The hotel 250 room hotel interior is finished in marble. The group is now pursuing other Maltese projects, including another hotel.

MALAYSIA

Fijian insentive to investors

The Fijian Government has announced financial concessions to Malaysian investors interested in building hotels in the country. Fiji's Prime Minister Sitiveni L. Rabuka said the concessions would be limited to the first five hotels to be built on condition that they were completed by the year 2000. He said that the concessions include "duty free import of materials needed to build the hotels, easy repatriation of profits and 20 years tax free status. The investors would be allowed to generate their own power and can sell any excess power generated to the Fijian national grid". Although these concessions are aimed at the building of five-star hotels, applications to build four-star hotels or less outside the main tourism belt would be considered. Rabuka said that Fiji intended to increase revenue from tourism by attracting investors willing to construct facilities catering for tourists.

PORTUGAL

Office vacancy rate decreases in Lisbon

The vacancy rate for new office space in Lisbon is expected to decrease from 4.1 percent at the end of 1995 to less than three percent by the end of this year, according to a survey by the international property consultants, Richard Ellis. They found that Lisbon ranks in second place of 30 European cities in terms of value for money for office space, ahead of cities such as London, Barcelona, Paris, Madrid or Berlin. The estimated take up for 1996 of new space, including

Concrete pier for Swedish accolade

The Pier Building "Örnen", Gothenburg has been nominated for the Swedish Concrete Institute Architectural Prize 1996. The Pier was conceived as a service building for the public boats that operate on the Göta Älv. The building acts as a new identity building and is part of the Design Management for the "Knowledge Centre" Lindholmen lying behind the offices and study rooms of 7,000 students and employees.

Arup designs for City of London

A high profile 2.9 acre Plantation House site in the heart of the City of London is under development. British Land Company PLC has submitted planning permission for 100, 000 metres square of world class office space. The masterplan, designed by Arup Associates includes three office buildings each with a prominent entrance. The entrance for the Fenchurch Building (21,300 square metres net) is on the corner of Fenchurch Street/Rood Lane with the opportunity for an additional entrance from Mincing Lane. The Central Building (32,800 square metres net) takes its entrance from Mincing Lane directly into the dramatic central atrium. The Eastcheap Building (14, 625 square metres net) is accessed from Eastcheap. DEGW have been involved with space planning of the interiors.

Jardine Matheson's slice of Hong Kong property

The project for the expansion of Hong Kong's port was deadlocked for more than three years by a Sino-British dispute. Jardine Matheson were involved in the Tsing Yi consortium which won the contract, but Beijing objected to their involvement claiming they won the contract through political favouritism – a charge denied by the colonial government. The proposed CT9 terminal building problem was solved when Malcolm Rifkind, Britain's foreign secretary visited Beijing in January this year and proposed a reshuffle, swapping berths with existing terminals thus allowing China to approve the deal without annulling its refusal to see the Jardine group involved in CT9. CT9 is expected to take two years to build at a cost of HK$10 billion and official forecasts show the extra capacity will be required by January 1999.

As the news of the port go-ahead came through, Matheson Pacific announced their biggest investment in the Hong Kong property market for more than 10 years. Hongkong Land, the property arm of the Jardine Matheson group, is to invest US$200 million in an office site on the east side of Hong Kong island.

Matheson had sought to diversify its interest and reduce its dependence on Hong Kong, prompting a series of acquisitions in Europe and other Asian markets. However, according to the managing director of Hongkong Land, this investment does not constitute a reversal since the group has continued to bid in several recent property projects. However, analysts say that even though this is a small investment by the standards of many Hong Kong property projects: it reflects an upturn in the sector and confidence about prospects after the territory's handover to China next year.

buildings developed for own use, should be around 80,000 square metres whilst the supply of new space available should be about 75,000 square metres.

UK

BDP in the shadow of the Manchester bomb

Building Design Partnership and the urban regeneration team of accountants Levy Gee, have just concluded the first stage of a feasibility study for the conversion of a redundant 18,600 square metre (200,000 square foot) postal sorting office in Manchester city centre into an International Fashion Trademart. The building will house five levels of showroom galleries around a large atrium space, over four levels of car parking, all within the existing structure. The top floor of MIFT, which will enjoy dramatic views across the Manchester skyline, will have exhibition, performance and entertainment space.

Foster skyscraper planned for the Baltic Exchange site

Trafalgar House Properties, owner of the former Baltic Exchange in the City of London which was severely damaged by an IRA bomb in 1992 claimed the restoration of the listed building was not viable because the floor plan dictated by the shape of its historic trading hall deterred potential tenants. Plans are underway to submit a proposal to the Corporation of London for consent to build Europe's tallest skyscraper, a 1,000 foot tower designed by Sir Norman Foster, on the site in St Mary Axe.

US

US/Korean partnership for Trade Centre

Leonard Parker Associates, Architects Inc in association with the Korea Architects of Seoul, Korea, were awarded first place in a Korean open design competition for the Taegu Trade and Exhibition Centre to be developed by the Taegu Trade Centre Corporation. The 49,000 square metre complex includes an Exhibition Centre 24,000 square metres and a Trade Centre 25,000 square metres.

JPRA Architects/Peterhansrea Design shopping spree

After completing a US$30 million extension of the 1967 Somerset Collection regional shopping centre in Troy, Michigan, the developers Frankel/Forbes-Cohen Properties have decided to embark on the construction of Somerset North, a US$60 million three-level regional shopping centre opposite the sixties building.

Calatrava commissioned by Milwaukee Art Museum

By 1999, a 58,000 square foot addition to Eero Saarinen's sculptural Art Museum will stand on the Milwaukee lakefront. A single-storey, vaulted gallery will follow the shoreline of Lake Michigan connecting Calatrava's 60-foot-high entry pavilion with the landmark 1957 museum. The Museum Director, Russell Bowman hopes that the "bold, futuristic" pavilion will serve as an architectural symbol for Milwaukee. It will add 25,000 square feet of exhibition space, accommodate up to 800 visitors and seat 300 in the new lecture hall in order to relieve acute overcrowding.

ERRATA

WA 42 page 41 and *WA 48* page 25 featured a design for the new corporate headquarters Tenaga Nasional Berhad in Kuala Lumpur, Malaysia. We should make clear that the project was designed as a collaborative effort between GDP Architects SDN BHD of Kuala Lumpur and RTKL International Ltd.

Ambitious plans for London docklands

Canary Wharf is set to embark on the biggest development since it was acquired from its bankers for £800 million (US$1200) last year. Until now it was a commercial site with 10 office buildings and a retail centre. Only 80 percent of the existing space is occupied but a consortium of investors including Paul Reichmann, the Canadian who led the development in the 1980s, and Prince al-Waleed bin Talal bin Abdulaziz of Saudi Arabia have decided to begin a programme of hotel and leisure development. In a joint venture with Hotel Properties of Singapore (who hold 70 percent of the stake) they are planning to develop an 11 acre site in phases over six years to create hotels and luxury apartments as part of a £300 million (US$450) development. The joint venture, aims to have started building by the end of the year.

Bomb threat to Docklands station

The glass roofed Jubilee Line station at Canary Wharf designed by Norman Foster is being reassessed in the light of possible bomb attacks. As the glass canopy is above the passengers, "drop out" and "fall-out" tests are being carried out by Ove Arup & Partners and the specialist group NERO to ensure that any movement in the station building does not result in disaster. Tarmac, which has been working to an accelerated programme, is confident that the station can be finished on schedule by 28 March 1998.

Bombay property anomaly

The Bombay property market can still provoke disbelief. The world's highest rents for some of the worst international office space on offer. Property analysts Colliers Jardine site three major anomalies: rental deposits of more than US$307,500 for basic executive flats; long-standing tenants paying peppercorn rents and thousands of vacant units despite a dire housing shortage. Rent Control acts could be introduced over the next 12 months. In addition the Indian government is making "positive noises" about reforming the Urban Land Ceiling Act which caps the size of sites that can be acquired by developers.

People and Practice

Obituaries

Dame Jane Drew

Dame Jane Drew who has died aged 85, was one of the foremost British architects of the modern movement. Much of her work was in tropical countries, chiefly Ghana, Nigeria, India and Ceylon, where she made a study of climatic conditions and their effects on buildings. By examining how modern building technology could address these problems she made a functional adaptation of the modern idiom to tropical building. She began to specialise in tropical work on a project for Peter Koinage, in Kenya. Later she went to West Africa as Assistant Town Planning Adviser to the Resident Minister of the West African Colonise (1944-45). This led to much work abroad where she designed schools, houses and colleges and in Nigeria she worked on the design of University College Ibadan, the first university in West Africa. Among Jane Drew's most notable works in the country of her birth, England, were the buildings of the Open University at Milton Keynes, housing at Harlow and a School for Deaf Children in Herne Hill. She was also closely involved in the establishment of the Institute of Contemporary Arts at the Carlton Terrace site.

Jack Barnett

Jack Barnett, one of South Africa's most distinguished architects, has died aged 71. A recipient of the Institute of South African Architects' Gold Medal of Honour in 1982, he was best known for the Baxter Theatre in Cape Town (1977).

Company news

US

Bob Huddleston has been promoted by Ellerbe Becket to be president of its construction subsidiary. Huddleston will provide the third arm of a unified leadership structure designed to bring competitive advantage and foster long-term relationships. He will also increase recognition of the firm's construction capabilities to a level with its architecture and engineering services.

Kirk Ian Mettam, joins HLW International as a partner

Based in HLW's New York headquarters, Mettam will also oversee the structural design efforts of the firm's associated offices in California, Europe, the Middle East and China.

Honolulu

Wimberly Allison Tong & Goo have promoted Ronald Mitchell to Principal. Mitchell joined WAT&G in 1990 and has been promoted from President and Chief Executive officer to Vice President and Principal.

SPAIN

Spanish construction alliance

Fomento de Construcciones y Contratas (FCC) and Dragados y Construcciones, Spain's two largest construction companies, have formed an allience which will create Europe's fifth-largest contactor group with sales of US$6.7 billion. The new company will benefit from Dragados's international experience and FCC's capital. Analysts predict that the allied companies will now become involved in the build up of toll motorways planned by the Spanish government, as well as in the construction of a high-speed rail link between Madrid and Barcelona.

UK

SOM London

Roger Whiteman has been made director of Skidmore, Owings & Merrill's London office. Whiteman has worked for SOM since 1986 as project manager for the Meyerhold Centre office and residential complex in Moscow as well as working in Amsterdam, Ljubljana and Seoul.

Institute news

UIA Elections

Sara Topelson de Grinberg (Mexico) was elected President of the UIA by a simple majority of 136 votes (44 for DJ Hackl and 42 for G Adlercreutz). Topelson de Grinberg, 15th President of the UIA is aged 49 years and is the first woman to be elected to the presidency of the International Union of Architects. Elected for a three year mandate, she succeeds Jaime Duro Pifarre (Spain) and will assume office, at the next meeting of the UIA Council in Chandigarh (India) at the beginning of 1997.

Vassilis Sgoutas (Greece) out-going Secretary General was returned to office. Enrico Milone (Italy) out-going Treasurer was elected by 180 majority (Seif Allah Alnaga from Egypt got only 41). Vice Presidents include: Gunnel Adlercreutz (Nordic Countries); Moshe Zarhy (Israel); Donald J Hackl (USA); Ren Suzuki (Japan); Salah Zaky Said (Egypt).

US Academy of Design

Earl R Flansburgh, FAIA Architect, founder and President of Earl R Flansburgh + Associates, Inc, a 33-year old Boston-based architectural and interior design firm, has been elected Academician member to the National Academy of Design. Founded in 1825, the National Academy of Design is the only artist-run organisation in the arts world in which the assessment by the artists themselves determines who is to be honoured for achievement.

New President for PAM

The Malaysian Institute of Architects (PAM) has elected to displace president Henry Lee before the end of the customary two year term. A *World Architecture* source in Kuala Lumpur has indicated that the election of P Kasi as Lee's successor is a sure sign that the architectural profession in Malaysia is moving forward. The time has come for proactive campaigners to take over from the "seat-warmers".

ERRATA

World Architecture apologises for the misrepresentation of "The Peter Van Kerchkhove Partnership" on page 66 of *WA47* "Benelux – Major architectural practices/design firms", referred only to "Bureau d'Architecture HENRI MONTOIS SA". The Peter Van Kerchkhove Partnership has a total of 89 architects working in four offices under three names: Bureau d'Architecture HENRI MONTOIS SA; Ingenieurs-en Architektenbureau VAN KERCKHOVE BVBA; NV Technisch Studiebureau STUDIUM. Recent projects include: the Belgian Airport Terminal Company, Indosuez Bank, Bernheim Outremer, AG 1842 Insurance Company, Cofinimmo, The Luxembourg Ministry of Foreign Trade, SunParks International, Religious Congregation of the Brothers of Charity, University of Louvain, Belgian Ministry for Public Works.

Breakthrough design for new Malaysian University

Successful urban planning is not a phrase readily associated with architecture in Malaysia. But recent years have witnessed a move in the right direction – none more so than the recent development plan for the University Malaysia Sarawak approved by the Malaysian Ministry of Education and the State Government. The international design and planning group, NFA are working in association with local architects ADC (Kuala Lumpur). This is an extraordinary initiative because NFA produced a working "development masterplan", demonstrating the flexibility of a "framework for growth which will ensure orderly development, the creation of places and at the same time allow freedom for variation overtime." This is the first such masterplan in Malaysia. The other unique aspect of the design is its accommodation of the growth of "virtual education" in the twenty-first century, whereby the seminar structure of the education and televising of lectures requires fewer lecture halls and "the opportunity to think strategically about intelligence systems at the scale of a new town".

The masterplan has been modelled on the successful University of Louvain-la Neurve in Belgium. As with many of the older seats of learning throughout Europe the university is at the hub of a rich urban fabric which includes hotels, residential areas, shops, offices libraries, sport facilities etc. The plan in Malaysia is to use the new university as a catalyst for significant, organised, urban development. Such additional facilities will be available for use by the public, and it is hoped that they will be developed by the private sector, thereby contributing to the continued economic growth of the region. The jewel in the crown of this innovatory scheme is the development of low-energy buildings on a site with a complex and fragile ecology. "It is an objective that in its layout and design the University will act as a demonstration of the critical leap from environmental management to ecological development."

Whether NFA will be employed beyond the first phase is yet to be determined. Given their extensive experience in the region and their inspired solution to the as yet undeveloped area of Sarawak it would be a shame to see the opportunity given up.

Peter Verity, a director of NFA, will be the subject of an interview in next month's Country Report on Malaysia.

Architects vital statistics in Germany

by Layla Dawson, Germany correspondent

According to *Information for Students* published by Bund Deutscher Architekten, it would appear that Germany already has an over proportional number of architects. Of the 70,000 registered about half are self employed. At the same time there are 45,000 architectural students working towards "Diplom-Ingenieur" or "Hochschuleigener Abschluss" with either technical or design bias, in 15 universities, 44 specialist colleges and six art academies. The time required to complete an architectural course depends very much on the student's financial background, whether they have to work their way through college or take out loans. It takes between 10 and seven semesters (terms of six months each) of full time study. Students rarely leave school before the age of 19 to 20 with their "Abitur" and boys have to take time out of a period of up to two years for army or social service. Under optimum conditions an architect is unlikely to achieve purely academic qualifications before the age of 24 for women, and 26 for men. In reality many are almost 30. Comparing student intake with numbers who qualify it is evident that there is a large amount of waste in student's and college's time and effort with almost 45 percent of students not being able to complete their studies. In 1992, 4,329 students qualified in comparison to the 7,846 architecture students who enrolled for their first semester in 1993. Statistics for female students and qualified architects are good; almost 50 percent of the students and newly qualified were women in these two years, but only 12 percent of the 79,310 working architects are women who have gone on to other careers. With the tail end of the German building boom in sight, after six frantic years of building and investment incentives, following reunification, unemployment among architects is still low; 2,683 in 1995 of which two percent were women. The figure may be higher due to the reluctance of women to register as unemployed if their partner works. Although architects put in long hours the rewards are reasonable by German standards. An employed beginner can expect around 4,600 DM and an experienced architect 9,300 DM per month. The postman delivering their letters earns around 2,000 DM.

Vancouver afloat on Asian cash

According to Chinese-Canadian architect, Bing Tom "cities reach a certain critical mass and then take off. I think Vancouver has just reached that point."

The main influence seems to be an influx of Asians to the area: this is particularly evident in Richmond, the suburb adjoining the airport where six shopping malls are owned by Asian interests and cater mainly for the Chinese community.

House prices in Vancouver are high because thousands of houses and condominiums in Vancouver are owned by landlords in Hong Kong, Taiwan, South Korea, Singapore and Malaysia. Many buyers have never seen their properties, relying on friends or agents to make a wise choice on what to buy.

A new international terminal has just opened at Vancouver airport to handle the fast-growing traffic across the Pacific and US Canadian border. More than 300 applicants vied for 58 retail outlets there.

In the office sector, Colliers Macaulay and Nicholls, the city's largest property broker estimates that the vacancy rate for prime downtown office space will decrease and some agents predict a shortage within the next two or three years.

Terry Hui, president of Concord Pacific Developments which is realising North America's biggest private property project on the 200-acre site of the Expo 86 World Fair, said that "A lot of capital is chasing after very few assets".

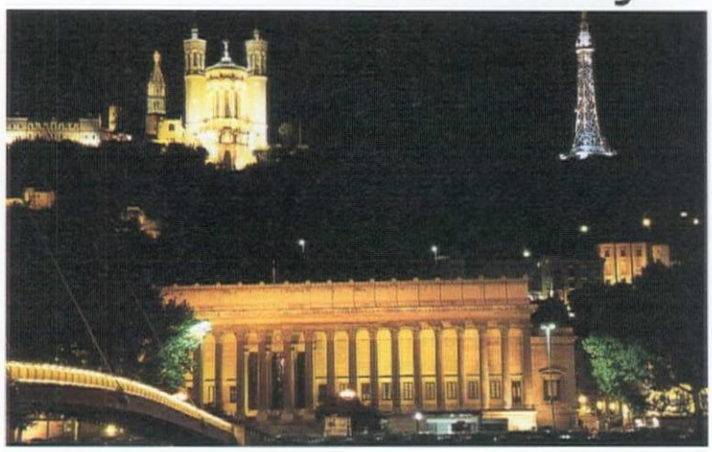
So what is attracting all these investors to Vancover? Mr Hui suggests that the stable political and economic climate makes Vancover a very good place for passive capital.

Canadian Imperial Bank of Commerce predicts that the British Columbia economy will grow by 2.7 percent this year rising to 2.9 percent in 1997.

The influx of foreign investors is difficult to measure because the large immigrant population has blurred the distinction between foreign and local investors. Partnerships between the two are common, with a local developer obtaining official approval for a project and then seeking a foreign backer. The sources of finance include venture capital funds set up under immigrant investor programmes which enable foreigners to qualify for permanent residence in Canada by investing C$250,000-C$350,000 in a local business.

Mr Kelly Heed, Colliers Macauley Nicholls vice-chairman claims that Asian involvement "has changed the dynamics of development. We lack a little of the long-term thinking that they bring to the table".

"The Creative City"



The city of Lyon — using a far-reaching urban lighting plan to develop a creative, competitive edge.

by Carl Gardner at "The Creative City" conference in Helsinki in August

Before the event, which was organised to look at the possible ways innovation and creativity might be programmed into the life of cities, no one knew what to expect – and by the end no one knew if they'd had it. But then one might at least have predicted that a novel, cross-disciplinary event of this kind, bringing together 170 urban planners, arts theorists, local government personnel, IT specialists and a sprinkling of architects and designers from 10 different countries, would have been somewhat slippery and allusive, rather than cohesively single-minded. The premise of the event was clear: in a post-industrial age, the competitiveness of First World towns and cities will depend, largely, on their intellectual capital – the innovative and saleable ideas of individuals and companies within the so-called "creative industries", of which architects and designers are a crucial part. Equally important too, in maximising this creative potential, is their degree of cross-fertilisation – the links and networks between them – and the enabling environment and milieu in which they operate. How do cities go about developing and nurturing a dynamic creative sector? Can new information technologies help in the process? And where are the best examples from which we can learn?

The event kicked off propitiously, with far-ranging presentations by Professor Peter Hall of University College London's Bartlett School, UK – and Jeff Mulgan, founder of the post-modern think-tank, Demos. Hall surveyed the varied factors which made the great creative cities of the past – from ancient Athens to post-war Los Angeles. Did they hold clues to the emergence of the next "innovative wave"? And where would the next "killer applications" of information technology be developed? Hall closed by dismissing the view that the global "information superhighway", "the death of distance", would lead to the ultimate erosion and dispersal of cities altogether. Mulgan in turn, insisted that we had to dispense with the idea of "society as a closed, smart, well-ordered machine" – the creative cultures of the future would be open, unpredictable systems, marked by complexity, inconsistency and unorthodoxy – and that demanded new forms of education, enterprise and art.

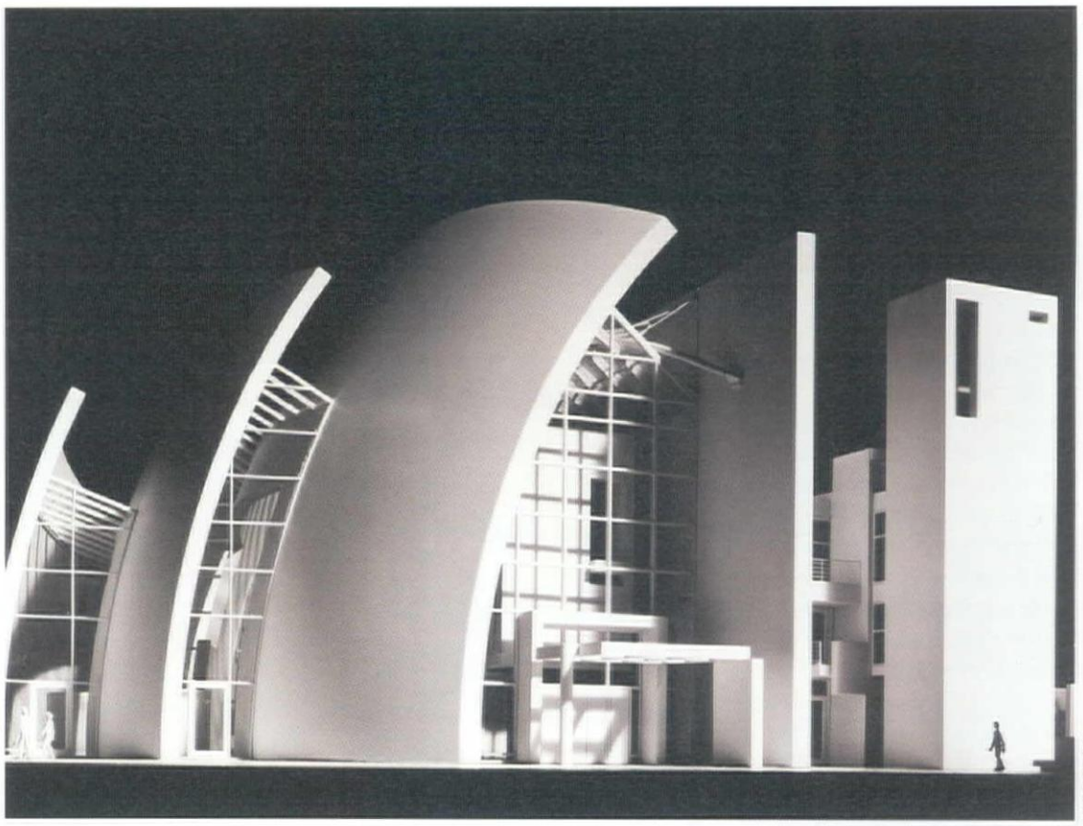
After that, during the multiple and overlapping seminar sessions, the thread was often lost – and occasionally found. Too many PhD students grinding their own abstract furrows – and too many art theorists unable to move from the particular to the general. To declare my interest, I gave a largely empirical account of how the city of Lyon has used its innovative urban lighting plan to stimulate its night-time economy and strengthen its competive identity within Europe. Many of the best presentations were by practitioners "on the ground", such as Phil Wood's account of the local government policies that enabled Kirklees, in West Yorkshire, UK, to develop a thriving "creative milieu" – and, from Finland, Kari-Hans Kommonen and Raimo Lang's fascinating dissection of the "home of the future" and its place in the web of creativity. All in all a mixed bag – but certainly worth developing further, for the sake of all our futures.

Meier for Church of the Year 2000

by Kelly Shannon, Italy correspondent

Rome, the mythical Eternal City, is preparing itself for the end of the millennium. Public projects are being planned non-stop and the Jubilee, which coincides with the Holy Year 2000, will bring thousands of tourists to Rome and the Vatican. As part of the Church of Rome's programme to build 50 new churches for its expanding population (especially in the city's periphery), a series of commissions have been issued. Most of the commissions will no doubt go to Italian architects, however, as a symbolic gesture to the global nature of the event, a foreign architect was sought for the Church of the Year 2000.

In late May, Richard Meier & Partners Architects (already commissioned by the Comune di Roma to restore the Ara Pacis monument) was chosen as the winner of an international competition. The other 5 invited architects were Tadao Ando, Günter Behnish, Santiago Calatrava, Peter Eisenman and Frank Gehry. The project, overseen by the Archdiocese of Rome, is for a new parish and community centre serving the 8,000 residents of Tor Tre Teste, a lower-middle-income housing complex built in the 1970s on the city's eastern periphery. Four shell walls, each independently supported and made of on-site reinforced concrete articulate different spaces within the building: the main sanctuary, the weekday chapel and the baptistery. The community centre, built on an L-shaped plan, is attached to the north side of the church by two bridges. The 2,000 square metre complex will be built at an approximate cost of US$5 million.



Jock Pottle/Esto

Rome's unique history dictates that its urban fabric has always been a combination of the monumental juxtaposed with the simple; however, few "modern" monuments have appeared in the city of the living museum. The courage of the Church of Rome should be recognised for choosing Meier; for allowing the rich and magical home of the Italian artistic genius to be confronted with a foreign "white glare".

During the Jubilee, the comparison of Meier's concrete shells with Bernini's colonnade in the Pizza San Pietro will serve as a barometer for judgement on the continuum of Rome versus the shock of a foreigner. Rome has set itself up for the difficult task of leading Italy towards complete modernity on an equal footing with international trends. History will relate how a Meier building will contribute to this.

The creating of "Holy War Construction"

Israel's 17-day bombardment of Lebanon in April was aimed at Hizbollah (Party of God) the Shi'ite Moslem fundamentalist militia. However, it was suggested that Israel's bombing seemed targetted to stall the Lebanese reconstruction programme. Indeed the construction industry and Hizbollah are more closely linked than many realise through their building company: Jihad al-Bina (Holy War Construction).

Hizbollah is trying to articulate a national vision for the Lebanon after years of civil war. Its resistance to Israel's bombardment of Lebanon and the wave of nationalism that followed it, have put the organisation – regarded as a deadly and effective part of an Iranian terror network by the Americans and Israelis – in a position where it wants to enter government.

Reconstruction plans for Lebanon have been widely publicised. The bombing of two electrical plants by the Israelis resulted in minimal set backs. Despite its Syrian relationship and Iranian patronage, Hizbollah aspires to be a Lebanese organisation and as such is making a bid for a national role in Lebanon in order to secure and consolidate its future there.

Since they are in the throws of a Holy War, it should come as no surprise that they are hoping to convince the Lebanese that they have a constructive part in its future through organisations such as Jihad al-Bina, Hizbollah's building company which was first introduced in southern Lebanon and south Bei-Shi'ites in the Gulf and in the form of Islamic Tithes which have made the organisation largely self-sustaining.

Active reconstruction such as the US$100 million Imamen mosque in the southern suburbs of Beirut which will include hospitals, schools and research centres, is being paid for by Mr Mohammed Hussein Bahman, a wealthy Kuwaiti Shi'ite.

A third of the country's population are Shi'a, and many of these are dispossessed and rely on an extensive welfare network centred around Hizbollah. The fundamentalists have illicited funds enabling them to provide hospitals, clinics, schools and centres of research and religious learning, orphanages and foundations for the families of resistance "martyrs".

The organisation's 36-year old leader Sheikh Hassan Nasrallah, was quoted by the UK's *Financial Times* newspaper as saying: "We represent a wide and popular trend and we want to participate in the political life of Lebanon and in the administration of the country." WA

OnScreen

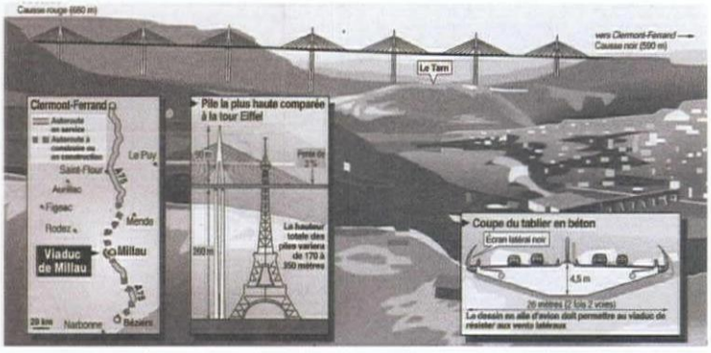
Below from top *A distorted image of Foster and Partner's design for the Grand Viaduc de Millau was published in both* Le Figaro, *and, as shown below,* France Soir; *Artist's impression of Bridge over the River Tarn, from the Foster and Partners office; AutoDesk WorkCenter, workflow automation*

A bridge too far for Giscard?

August is normally closed season on architecture in France: so it was surprising to find on the front page of *Le Figaro* an open letter from the former French president Giscard to Jacques Chirac asking him to overturn the jury's decision on the 2.5 kilometre Millau motorway viaduct design, won in closed competition by Foster and Partners together with a consortium of French engineering companies. Giscard argued that the bridge failed aesthetically, and that alternative designs would fit better with the landscape as well as meeting cost requirements. The letter was illustrated with a computer image of the design seen from above the valley floor.

Foster's proposal is for a multi-span cable-stayed structure in seven sections, with the road deck supported on masts rising a further 90 metres above. At the highest point, the deck will be 275 metres above the river Tarn. This is an enormous structure, dictated by the site (as the cost of running the motorway over the valley floor would have been prohibitive). Foster's design is an engineering masterpiece, functionally taut and elegant. A senior engineer at the Ecole des Ponts et Chaussées described it to *WA* as one of the most challenging and exciting designs he had seen in years: the alternative plan, using a 600 metre wide central arch as part of an eleven-span structure, would not only be much more costly to build, it would also be visually much more obtrusive.

Giscard's attempted intervention seems to stem in part from a misreading of the computer image. This image is not a rendering, but a schematic: it shows the relation of the main elements of the existing landscape to the new structure, but without detailed perspective and without true scale. The cables that support, fan-wise, the road deck, appear to be as wide as the masts themselves, which are again over-stated in the schematic. Foster's design has been visually wholly misrepresented, to support a dubious case. The jury's decision must be respected, and the opportunity seized to create a true *ouvrage d'art* in both engineering and architectural terms.

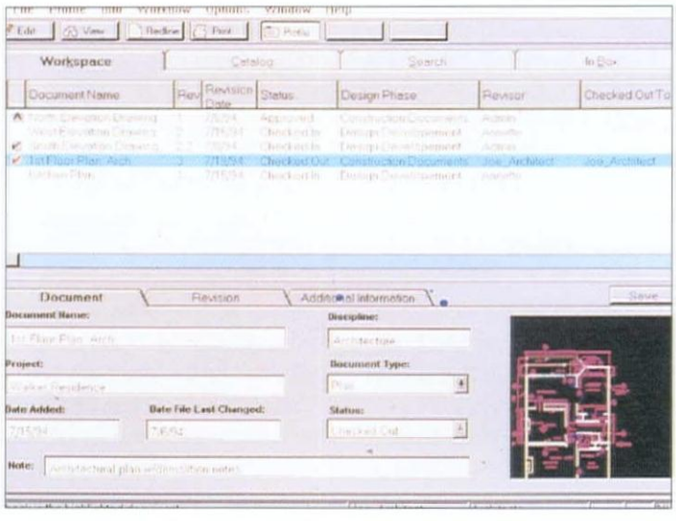


US$250 billion in cyberspace?

"The Internet and the World Wide Web will create such a large market over the next 15 years that it will add US$250 billion to the share values of companies working in the same area." This comment by John Chiplin, CEO of virtual-reality software makers Superscape comes from a Morgan Stanley report. They based their projection on the success of the personal computer market between 1980 and 1995 and predict a similar explosive growth in commercial Internet and Web developments, and the increasing use of Intranets within companies. Intranets are closed nets with the graphics, sound and video functionality of the main Web, that are increasingly used for internal communication and conferencing within large companies.

Superscape in turn predict that a large part of this market growth will be concentrated in desktop VR systems, rather than the immersive or games VR market. As a major supplier of VR systems for simulation and training, they see this as a splendid opportunity for growth. But what are the implications for architecture? They are two fold: firstly, clients will become more familiar with virtual environments, and in using Net software to explore such documents. Secondly, the cost of authority and visualisation tools is bound to fall, giving architects access to the possibility of creating virtual reality models of their projects. If the Net and the Web expand as predicted, this will offer architects a major opportunity to expand their range of presentation and communication skills.

For more information contact http://www.superscape.co.uk



AutoCAD lines up

The movement towards electronic handling of drawings increases: the Internet and Web are already used to post material on projects, and more and more large corporations are joining the ranks of those using intranets to handle internal documents. To meet this demand from architects and the construction industry, Autodesk have announced the release of 1.2 of their WorkCenter document management and workflow software. The upgrade contains the usual bells and whistles, particularly in providing support for Windows NT, with support for Windows 95 by the end of the year. The decision to include Windows NT support came from a study of client preferences.

More importantly, the new release is a platform for "WorkCenter on the Web". Autodesk are including Web enabling technology to WorkCenter, so that it can be used not only to manage documents but also to publish them on the Internet or Intranets. The WorkCenter web site will provide a secure handling area for documents to be posted, downloaded and uploaded by different team members. This development is the product of a strategic partnership, between Autodesk and Documnetum Inc, of Pleasanton, California, a leading software producer in the management field. Autodesk are also the only main CAD producers endorsing ONE, Netscape's proposed open system for net communication of 2D and 3D images and text.

For more information contact http://www.autodesk.com **WA**

Downsizing to what?

"...the global design firm of tomorrow is going to have to travel even lighter and move even faster than it does today."

It was the American art historian George Kubler who said, "There can be no great events without great causes," and undoubtedly one of the best examples of the truth of his words has been the massive political and economic fallout that followed the end of the Cold War. Over the last six years the results have ranged from bankruptcy and mass unemployment in the aerospace industry of the former Soviet Union, to the conversion of America's Rockwell International corporation from the status of a debt-laden B1 bomber maker, into that of a debt-free manufacturer of 80 percent of the world's fax modems.

And what has this to do with architecture? By analogy, quite a lot. Architects too, like Generals, Admirals and munitions industry tycoons, have had to do a fair bit of diversifying and repositioning since 1989, and in their case the cause was also Cold War related. As well as throwing the defence contractors of both sides into chaos, the fall of the Iron Curtain made possible the beginning of a truly global market in building design services. Up until then, in the separate markets of the United States, the Far East and Europe, it had been possible for quite large design firms to survive within national boundaries.

After 1989 that kind of protectionism became impossible. The ramifications of the collapse of the Eastern trading bloc penetrated into every sector of the construction economy. Reduced public sector spending and the Western and Japanese property crash of the early 1990s were both in part triggered by shock waves from the disintegration of the Comecon system. So much so that when the Eastern bloc finally regroups sufficiently to invade the low cost/high risk end of the Western property market, the event will mark the beginning of a free for all in design services whose effects will take years to assimilate.

Competition, it is said, improves the breed, but it does it by thinning down the margins and weeding out the runners. Over the post-Cold War years, wherever European and North American design firms have competed in south east Asia, the Europeans are the ones who have suffered because of their traditionally inflexible contractual arrangements, and their resistance to simplification and repetition in design. Wherever North Americans have competed with Europeans in Europe, they too have suffered because of their resistance to the competition system and the damage done by the steep learning curve imposed on them by unexpectedly devious EC bureaucracies.

True globalisation offers competing markets to even out differences, but even in the first post-Cold War phase this evening out process clearly did not change the fact that half the design cost of a new building comes down to the cost of producing architectural drawings. At present only high-tech communications, costly computerisation, design simplification and repetition can reduce it. Because this has always been the American way – efficiency coming naturally to North American and North American-trained architects – Europeans found themselves able to offer only vague "cultural" advantages as a compensation for the increased cost of doing things their way.

What then will be the next stage in global architectural diversification and repositioning? A good part of it will be internalised in the construction process. It will involve yet more shifting of responsibilities from the designer to the contractor via the contract manager, a process that has been gaining ground for a decade and more. It is in the nature of the increase in the scale of development, inseparable from the growing popularity of large, mixed-use urban projects, that not only are the major design decisions taken by engineers but, in the Pacific area in particular, new Design and Build contracts are increasingly formalising this shift of emphasis. Nor is Europe lagging by very much. Architects in the first world already work for contractors and engineers, taking their place as design sub-contractors with other specialist suppliers in up to 40 percent of all new construction.

As with the demobilisation of the mighty armies of the Cold War, another part of the change forced upon design firms by global competition in future will be directed at continued reductions in the size and cost of the design labour force. In a world boasting ever more sophisticated computer software to aid productivity – but also nearly a million qualified architects and two million students eager to use it – the most profitable design firms will be those that locate themselves strategically, without regard to tradition or nationalistic prejudice. The increasing role of fashion in signature architectural design, undercut by the high failure rate of speculative projects in general, will encourage them to base their design offices in urban areas where there are large pools of ambitious freelance talent: cities that boast cosmopolitan, well-endowed and well-equipped schools of architecture.

The most striking result of putting all these indicators together is the emergence of what looks like an exit strategy from large multi-disciplinary practice, which is probably what it is. Once again the global design firm of tomorrow is going to have to travel even lighter and move even faster than it does today, and that must mean dropping corporate ballast. As an experienced American global architect confessed last year; "It seems to me that the big full service architecture, engineering and construction firm is going to become as much of a dinosaur as the Soviet aerospace industry did. With fewer repeat clients, only a handful of construction consortiums can carry all that talent on a loss ratio of 20 or 50 jobs to one."

If he is right we may be looking at a future where even the biggest design firms will be looking to downsize and disperse their financial entities into small consultancies that will be able to tick over on preliminary design work and make the occasional sale of a successful project to a global development consortium. That, after all, is what Soviet Aerospace is doing now. *Martin Pawley*

Events

LECTURES, CONGRESSES AND CONFERENCES

AUSTRIA
More Efficiency for the New Millennium A symposium over two days. Topics to be covered include: the status of the global steel market, the latest CAD tools, Total Quality Management and the acceptance of EUROCODE 3. 14-15 November 1996. Contact Ms Elke Böhm. Tel: +43 1 53 54 839. Fax: +43 1 53 54 838

CHINA
8th International Federation of Landscape Architects Eastern Regional Conference 11-14 December 1996. Hong Kong Convention and Exhibition Centre. Tel: +852 2528 6136. Fax: +852 2865 1528

GERMANY
Constructec 96 Hanover The first of two congresses over the space of four days is the XXIV International Building Services Congress 5-7 November; the second is the Constructec Congress 6-9 November. For further information contact Karsten Brand. Tel: +49 511 89 32126. Fax: +49 511 89 32117

ITALY
Paradise on earth, the gardens of the XXI century 33rd International Federation of Landscape Architects congress (IFLA). 12-15 October 1996. Enic Go Round, via Faentina 40/r, I-50133 Florence, Italy. Fax: +39 55 583300

THE NETHERLANDS
Series of lectures at the Berlage Institute, Amsterdam Five o'clock lectures: René Boomkens "The Fearmachine" 17 October; Harry Kunneman "Reflections on subjectivity, architecture and urban space" 24 October. Evening lectures: Winy Maas "Massivity" 15 October; Stephan Beel "Recent Work" 22 October; Wilfried Wang "Conflict between dominant ideals and responsible ideas" 28 October. All lectures take place at the Berlage Institute, Marxixstraat 317, 1016 TB Amsterdam, Netherlands. Contact Sylvie Murphy. Tel: +31 20 428 5080. Fax: +31 20 623 7614

YUGOSLAVIA
Architecture and Urbanism at the turn of the III millennium 13-15 November 1996. The conference will focus on the issues affecting the architectural profession at the end of the millennium; including socio-political upheavals and new technologies. Sava center, Milentija Popovica 9, Belgrade, Yugoslavia. Contact: Ms Natalija Jurosevic. Tel: +381 11 3225254. Fax: +381 11 135919

ARCHITECTURE AND DESIGN COMPETITIONS

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 26 8143. Fax: +30 31 86 7870

HONG KONG
Monument for 1997 – Hong Kong International Ideas Competition A one-stage international ideas competition open to all architects and students of architecture. The challenge is to propose a monument to commemorate Hong Kong's return to Chinese sovereignty in 1997. The specific site, content and budget are left to the discretion of the entrant. Deadline for entries 31 October 1996. Jury adjudication November/December 1996. Contact Hong Kong Institute of Architects, 15/F Success Commercial Building, 245-251 Hennessy Road, Wanchai, Hong Kong. Tel: +852 2511 6323. Fax: +852 2519 6011

JAPAN
8th International Design Competition YUU in the quest of spiritual comfort and the relaxation of the mind. Total prize money US$71,000. Deadline 2 December 1996. Contact Mr Hada, PR Department, Japan Design Foundation, 3-1-800 Umeda 1-chome, Kitaku, Osaka 530, Japan

POLAND
"Szczecin 96", 6th International Plein Air Competition International competition organised by the Polish Architects Group (SARP)open to European architects. Plans are invited for the spatial and architectural development of the area next to the planned city-airport of Szczecin-Dabie. Competing teams of architects will commence by presenting general proposals. 5-14 October 1996. Contact Ewa Nosek at SARP: Plac Zolnierza Polskiego 2, 70-551 Szczecin, Poland. Tel/Fax: +48 91 339181

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

EXHIBITIONS

CANADA
Frank Lloyd Wright; Designs for an American Landscape, 1922-1932 Until 22 November 1996. Contact CCA 1920 rue Baile, Montreal, Canada. Tel: +514 939 7000

DENMARK
Integrated Art Taking place at the Egebjerggård housing scheme, located in suburban Copenhagen, under the auspices of "Copenhagen 96", a group of artists will create permanent works of art for squares and other public spaces in the area. Until 31 December 1996. Contact Copenhagen 96 Information Department, Amagertorv 21, DK-1160 Copenhagen K, Denmark. Tel: +45 33 77 96 33. Fax: +45 33 77 96 01

FINLAND
Timber Construction in Finland An exhibition combining historical trends and current developments within the field. Until 13 October 1996. Contact Ms Hannele Jröndlud. Rakennustaiteen Museo, Kasarmikatu 24, Helsinki, Finland. Tel: +358 0 661918

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

GERMANY

Design of the 50s, 60s, 70s and 80s A retrospective look at design over the last four decades, covered in four separate installations in four separate rooms. Until 31 December 1996. Contact Ms K Takvorian, Vitra Design Museum, Charles-Eames-Strasse 1, Weil am Rhein, Germany. Tel: +49 7621 702200

HONG KONG

Cities of the Future: towards a new urban living An exhibition of examples of new buildings by British architects working all over the world. The exhibition will take place at the Pacific Place Concourse, Queensway, Hong Kong and runs from 29 January - 1 February 1997. A half-day symposium will precede the opening of the exhibition. For full details contact David Blagbrough, British Council, London, UK. Tel: +44 171 3894940. Fax: +44 171 389 4058. e-mail: david.blagbrough@britcoun.org

ITALY

6th International Architecture Exhibition Held at Castello Gardens, Venice until 17 November 1996. The main exhibition "Sensing the future – The Architect as Seismograph" (curator, Hans Hollein) is being held in the Italian Pavilion. For information contact La Biennale di Venezia. Tel: +39 41 5218711. Fax: +39 41 5200569

THE NETHERLANDS

The Netherlands Goes to School Two centuries of school construction. 7 December 1996 - 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

SPAIN

Present and futures. Architecture in cities Organised originally for the UIA congress in July. Contact Centre de Cultura Contemporania de Barcelona, Montalegre 5, SP 08001, Barcelona, Spain. Until 27 October 1996. Tel: +34 3 4120781. Fax: +34 3 4120520

UK

Living Bridges A proposal for a new habitable bridge for the River Thames, London forms the centre piece of the exhibition which illustrates the contribution that inhabited bridges have made to the development of the urban landscape. Until 18 December 1996. Royal Academy of Arts, Piccadilly, London, UK. Tel: +44 171 494 5615. Fax: +44 171 439 4998

Christopher Nicholson The first retrospective of work by the influential modernist designer. Until 26 October 1996. The RIBA Heinz Gallery, 21 Portman Square, London, W1, UK. Tel: +44 171 307 3632

Charles Reilly and the Liverpool School of Architecture 1904-33 25 October 1996 - 2 February 1997. Under the professorship of Charles Reilly (1875-1948) the Liverpool School of Architecture became internationally renowned. This exhibition profiles his work and the work of the pupils that studied under him. Walker Art Gallery, William Brown Street, Liverpool, UK. Tel: +44 151 478 4614

USA

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

Between Fences An exhibition examining the role of fences in defining the American landscape and culture. Until 5 January 1996. Contact Public Affairs, National Building Museum, 401 F Street NW, Washington DC, USA. Tel: +202 272 3606. Fax: +202 272 2448

Humane Technology: The Eames Studio and Beyond Until January 1997. Museum of Modern Art 151 Third Street, San Francisco, USA. Tel: +415 357 4000

Three Buildings by Frank Lloyd-Wright; American spirit alive in Japan Until 19 January 1997. National Building Museum 401 F Street NW, Washington DC, USA. Tel: +202 272 2448

TRADE SHOWS

AUSTRALIA

Ausbex

Sydney Convention and Exhibition Centre, Darling Harbour, Sydney, Australia. 24-27 November 1996. An English speaking platform to access South East Asia. Contact David Aitken. Tel: +44 181 9107744

CANADA

IIDEX '96 International Interior Design Exposition 14-16 November. 13th annual exposition. The Metro Toronto Convention Centre, 255 Front Street West, Toronto, Ontario, Canada. Contact Johanna Hoffmann or Mary Hermant. Tel: +416 923 9335. Fax: +416 923 8162

FRANCE

Batinov 96

International building and renovation exhibition. 19-22 November 1996. Exhibition Centre Euroexpo, Lyon, France. Contact David Aitken. Tel: +44 181 910 7744

GERMANY

ORGATEC

Kolnmesse Exhibition Centre, Cologne, Germany. Contact Tony Pittman. Tel: +44 181 681 8166. Fax: +44 181 681 8028

GLASTEC

14th International Trade Fair. Covering machinery, equipment, applications and products. Contact Messe Düsseldorf. Tel: +49 211 4560 01. Fax: +49 211 4560 900

KAZAKHSTAN

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

SOUTH KOREA

Design Engineering Expo 1-4 November 1996. Contact, Kyungyon Exhibition corp, 17-1 Yoido-Dong, Yongdeungpo Ku, Seoul, Korea. Tel: +82 2 7854771. Fax: +82 2 7856118

USA

AISI Steel Home Seminars

Atlanta (October 21-25) and Houston (November 18-22). The American Iron and Steel Institute is conducting a series of hands-on training seminars on the use of light-gauge steel in home construction across the country. Tel: +212 705 7658

VIETNAM

VIETBEX International Building Expo 13-16 November 1996. International Exhibition and Convention Centre, Ho Chi Minh City, Vietnam. Contact David Aitken. Tel: +44 181 910 7744

South Africa

The South African economy is emerging from its worst recession since the 1930s, but after several years of negative growth there is now some basis for cautious optimism. There is agreement that a virtuous monetary route shall be followed and South Africa's rulers realise that any laxity regarding fiscal policy will lead to immediate and vicious penalties imposed by the international business community through capital flight. Such international action would destroy the Reconstruction and Development Programme (RDP) and all hopes of job creation, and inflation and interest rates would sky rocket. Peter Melvin and Inge de Beer canvas the opinions of the architects who are experiencing the shift from apartheid to democracy.

Opposite page *GAPP Architects. New water tower in Midrand – a powerful symbol for a town bidding to be the new capital of South Africa.*

Bottom *Jo Noero in association with Meirrelles Lawson Architects. The Gululetu Multisport Complex provides a light airy building in which the synthesis of function and form produce powerful architecture. The building answers to community needs and places a marker of hope in the sprawling suburban landscape*

President Nelson Mandela's message to the international community during his July 1996 state visits to Britain and Germany was South Africa's commitment to internal fiscal stability to attract international investment. Property and building construction forecasts are presently based on an assumption that consumer inflation will decelerate at one percentage point per year until it reaches five percent in 1999, and that interest rates will remain the same. This low inflation scenario will affect the construction industry positively in higher real rental growth, and would be beneficial to housing construction that has become a priority under the RDP.

High unemployment of around 35 percent remains a major problem however, with skills shortages being a significant drag on recovery largely due to apartheid education policies which were to produce a large unskilled labour force to serve a white dominated economy at a cheap price.

However the whites' share of income is dropping in relation to other ethnic groups whose shares are rising. And this is likely to continue given the African National Congress (ANC) economic programme which advocates affirmative action plus anti-trust policy which is designed to improve the position of blacks in the labour market and in the ownership and control of productive assets. The legacy of apartheid is evident in the health care scene, with South Africa's health status relative to income one of the worst in the world. While effective changes will improve access to health care, long term improvements depend on tangibledevelopments in the living conditions of the population as well as on improvement in the service itself.

The Reconstruction and Development Programme

The RDP is an integrated, coherent socio-economic policy framework. The RDP aims of integrating reconstruction and development in contrast to commonly held views that growth and development (redistribution) are processes that contradict each other, support a positive progressive investment in long-term productive capacity through human resource development.

Key infrastructural programmes will provide access to modern and effective services like electricity, water, telecommunications, transport, health, education and training. In this process the construction industry has a large part to play. In meeting the basic needs a substantial amount of land will be redistributed, over a million houses built, and supplied with water, sanitation, electrification, and access provided to health care and community facilities.

Delivery of the RDP has however been slow. In March 1996 President Mandela announced the closure of the RDP office and redirected five percent of the budget directly allocated to the RDP back to the treasury. This move would help to speed up delivery previously hampered by a laborious bureaucratic decision making process.

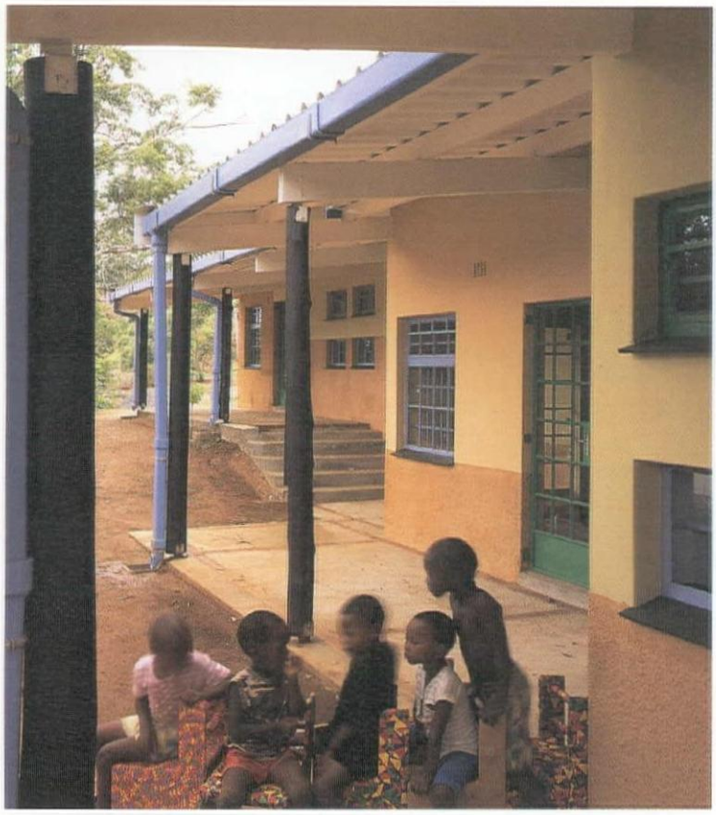
One of the RDP's first priorities is housing, now enforced as a human right by the new constitution. A subsidy system has been devised allowing individuals or family units a base subsidy. Subsidies, public and private sector funding, and end-user finance will be available for diverse tenure forms, community designs and housing construction methods. The delivery system encourages community participation increasing job-creation, formalising the self-help initiative that has characterised squatter settlements for years. Professor Julian Cook of the University of Cape Town leads a hostel upgrade programme in the Cape that aims at providing a range of options for single dwellers and families within upgraded and developed hostel complexes.

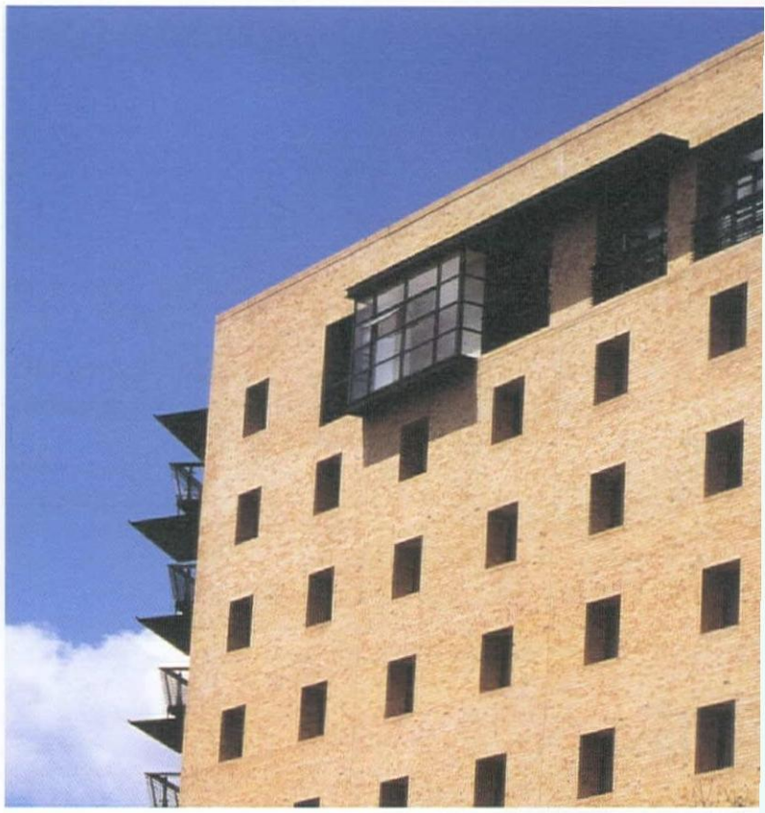
Delivery of housing is the RDP area most hit by criticism, as the one million houses in five years pledged by the ANC in 1994 show poor results. Only 40,000 units have been built so far meeting the number that the Apartheid Government managed in its final year of power. Joe Slovo, the late housing minister stressed the need for joint public and private sector involvement in housing, and it is Mpumalanga, the former Eastern Transvaal, who lead in delivery with large scale funding of just such joint initiatives.

Certainly the redress of inequality in the fields of housing, health and education cannot be realised out of the economy without more positive international interest taken in investment, and even then it will take time to implement the RDP. The initial five year plan has now been expanded to a long term 25 year programme and key economic growth is fundamental to the affordability of this venture. Faced with such a massive challenge there is a danger the demand on available funds will result in massive private sector packages being commissioned to meet the need for speed, and so eliminate much needed community participation and the job creation aspirations of the RDP. Peter Ahrends of Ahrends Burton & Koralek, a long time member of Architects Against Apartheid says that "there is a place for parallel thinking" in tackling these problems "but what the government should do is to bring some strategists on board to advise on these issues".

As a whole the RDP is the symbol of hope for millions of South Africans. The Katorus project of East Rand Township reconstruction and every newly completed RDP project are the showpieces of this ambitious need-driven programme aimed at restructuring and transforming South African society to provide a better life for all. And when asking what place there is for architecture in the new South Africa, architects and planners like Rod Lloyd see the capacity of architecture to offer hope, revealing to people that their richness and potential as human beings is important.

Dennis Gilbert





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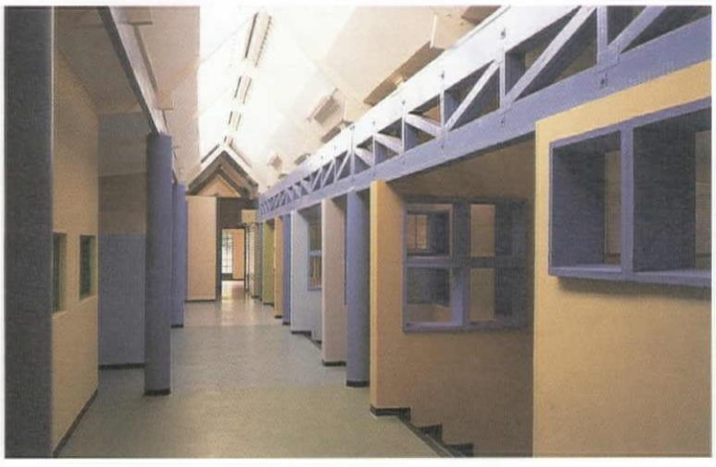


Above *GAPP Architects controversial design for the new Hyatt Hotel in Sandton, Johannesburg, has brought architecture to the front pages of South Africa's daily newspapers. The facades have been said to resemble Aldo Rossi's designs.* ***Above left and left*** *Liebenberg Masojada. Tree (Training and Resources in Early Education) Project, Durban. Exterior and interior of the education and care centre. A direct light source from the roof of the spine filters into the classrooms opening off the corridor. The exterior facade is enhanced by vibrant colour and imagery*

Architecture in a new democracy

Against these sobering facts "architecture" could be seen of minor importance, however historically a considerable international contribution has been made from Cape Dutch through to the modern movement and beyond.

Leon van Schaik in an article "Against Regionalism" in 1986 made a strong case for universal principles and standards to be applied to South African architecture. The term "regionalism" in his view referred to a first-world/third-world duality inferring discontinuity in the application of thought and skills to South African architecture. Architecture of the last ten years has followed very much the application of such "universal principles", and generally rather addressed the "first-world" needs of commerce and industry. The ISAA Merit Awards for 1994/5 still reflect this tendency, by its celebration of office buildings in the form of Safmarine House (Cape Town) by Louis Karol Architects, 136 Victoria Embankment (Durban) by Interarch Architects, Metlife (Durban) by Stafford Associate Architects with Dirksen Blumenfield Crause, smaller commercial ventures and a fair share of luxury homes.

An indicator that the climate is changing is the inclusion of three community projects by Jo Noero who has, along with a number of committed architects, supported the cause against apartheid. These buildings, a Community College (Soweto), Walberton Manor (Johannesburg) and Guguletu Multisport Complex (Cape Town) in association with Meirrelles Lawson Architects, create a language rooted in functionalism and understanding of the delicate balance between economy and need, and are prototypical in their approach. Perhaps this approach defines regionalism as a contextual response to regional problems in a language of architecture that is universally understood.

Of large scale projects international sporting events could benefit communities in a number of ways. South Africa's bid for the 2004 Olympics takes advantage of the RDP's development emphasis and added the credo of development to the existing Olympic themes of sport, culture and environment (added by the Sydney Olympic bid). The concern for African development and addressing the imbalances by altering the access of Africans (black people) to elite sport create a strong argument for the bid. The Games would hold economic benefit for the country and the construction industry. For Cape Town it would be an opportunity for inner-city restructuring by linking up decentralised black, coloured and Asian centres isolated by apartheid planning. Venues would be located between isolated centres creating new nodes and will provide facilities like a soccer stadium seating 65,000, exhibition facilities, shopping centres, housing and halls for sport development close to communities previously deprived from such facilities after the 2004 Games. Competitions for

What the architects say about...

The main building needs

Most architects consulted agreed that housing and community facilities are the primary building needs.

Rodney Harber of Harber Masson & Associates, Durban, a practice deeply committed to community plight, claims that the government is reluctant to enforce foreclosure on people who are boycotting house bonds and until this is resolved money will not circulate and the RDP will be thought of as "promises, promises". Because of the ensuing lack of confidence and the investment risk, an enormous amount of money is being channelled into shopping centres, hotels, casinos and security installations.

Jo Noero, a well known architect with a small traditional practice in Johannesburg: argues that the essential needs are social. The vast majority of people cannot afford to pay for the buildings they need and since the Minister of Finance appears to be more intent on assuaging the international community than addressing the problems of the poor, it remains to be seen how the procurement process will be managed.

Ivor Prinsloo of GAPP Cape Town office, the more commercial counterpart to their Johannesburg associates: is involved in a number of urban planning projects where he sees the main task as the attainment of settlements at various scales that function at every level, especially in the development of an appropriate urban culture that can be viable at densities higher than the African norm. The need for suitable and sustainable settlements is not a simple matter; jobs and security are perhaps greater needs at this time.

The wide role of architecture in meeting the building needs of the new democracy is perceived in a number of ways. Although *Rod Lloyd* feels that architecture does not hold a place in the forefront of solutions to national problems, and for the majority of urban dwellers expectations of a self-built shack is the norm, enrichment of buildings and spaces in the public realm must be provided in order to sustain communities that are otherwise devoid of care or hope in their private lives.

The effect of the new democracy on workload and practice

John Rushmere, of Erasmus Rushmere Reid, practicing in Port Elizabeth and the Eastern Cape: sees the growth rate of urbanisation as a challenge to cities and in particular the need to integrate and upgrade the fragmented parts of the apartheid city.

Jo Noero: since 1994 when support for buildings was switched from non-government organisations to the new government the pace of delivery has slowed considerably. Coupled with the reorganization of the civil service and the extensive consultation processes there is much frustration on the design side of the industry. As a result there will, in his view, be fewer projects; they will be bigger however, take longer and cost more.

Glen Gallagher, of GAPP Architects, Johannesburg, finds that in the conventional field developers seek security in designs that offer a Eurocentric solution with theme park concepts. He quotes the Hyatt Hotel in Johannesburg, a recently completed scheme of the group, as a typical example where the interior designer was instructed to provide African theme interiors. He also sees the need to return to basic principles of design in order to develop a truly South African architecture that takes indigenous forces on board and he sees a parallel in the way in which the ANC has developed the new Constitution.

Rodney Harber: sees practice changing fast with a need for new forms of contract and drawings to assist emergent contractors and in-house project management to ensure delivery. Projects will take longer and standards need to be revised. Community skills are vital and model making has a new role in communicating forms of construction and realisation.

John Rushmere: is concerned that whilst architects will need to hustle a role for themselves that is meaningful on a broad scale there should be a constant and continuing process of environmental education for all sectors of society. He sees the universal recognition of the potential for joy as essential to the experience of space.

Ivor Prinsloo: makes the pragmatic point that practice will simply need to get better by making more accurate judgments and by visualising and communicating the process and the end product more effectively.

The changing face of professionalism

The nature of professionalism is changing everywhere and the added stimulus of the need to deliver solutions to the needs of a new democracy is increasing the pace of change in South Africa.

Ivor Prinsloo: sees practice becoming more directly competitive and bureaucratic on the one hand and more participatory on the other.

Jo Noero: practices in a traditional manner but is concerned that the recommended fee scale is unsuitable for community projects which require an increasing amount of participation and interaction.

Rodney Harber: sees the professional offering management and impartiality which is increasingly important in ensuring that money is spent wisely on the real needs.

the main venues were held in June with a number of international entries.

Although a level of excellence in architecture has been achieved independently in the country, practice faces not only the global changes but the difficult process of redefining the job description where, for developmental work, consultation has become fundamental, and previous expeditious non-governmental organization (NGO) funding is now slowed down by being diverted through bureaucratic government channels. Committed anti-apartheid architects who have supported community work previously, have a head start having developed mechanisms to deal with the difficulties of such work. For many architects this changing environment would mean a reorientation, and for others their commercial work might only need a profile overhaul to address an evolving client base. The views of a group of architects representative of different types of practices have been enlisted to give an individual overview of the profession.

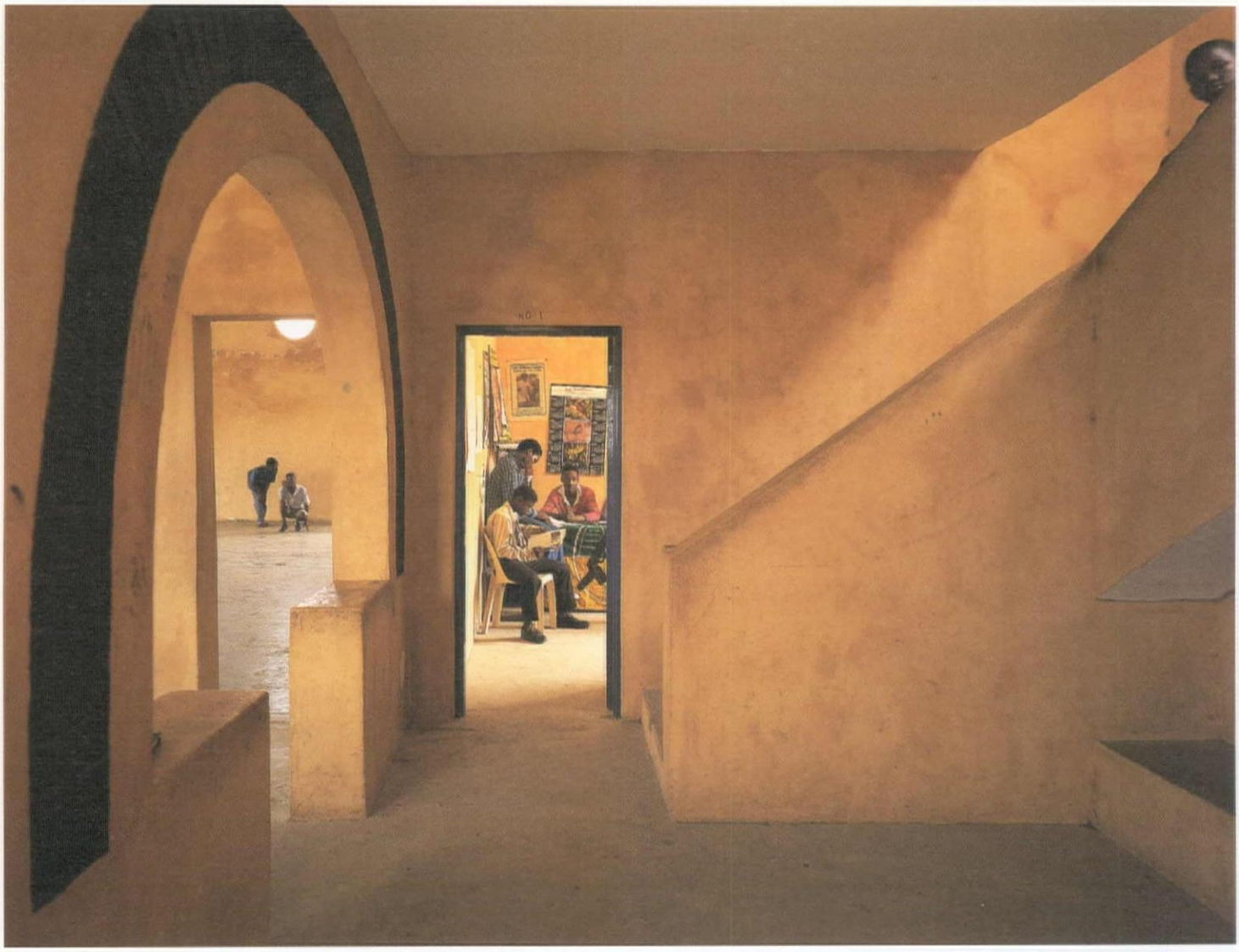
Architecture in the community

Various architects are concerned about the policy of affirmative action as a potentially disabling concept and subverting selection on the basis of quality and appropriateness. Any new situation as immense as the replacement of minority rule with democracy will generate a few casualties. It is hoped however, in the words of John Rushmere, "that architects will re-dedicate themselves to the ancient and abiding principles of humanism in design and persuade the government and community to adopt them".

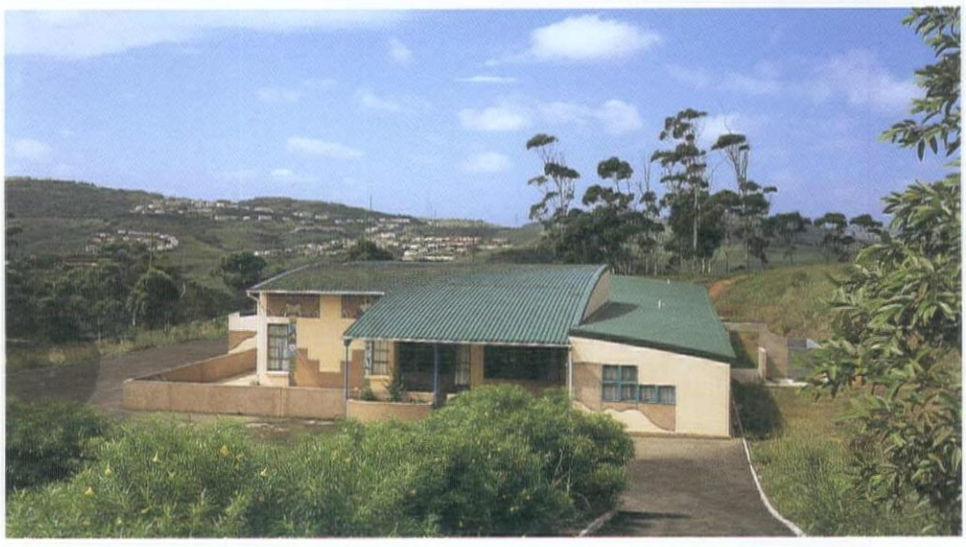
Over the past few years and in the anticipation of political change as well as a simple response to the needs of the wider community, alternative forms of practice have evolved in the offices of a few anti-apartheid architects, who are now well aligned with changing practice. Caren Smuts has been involved with community projects since 1982, and achieved funding through various international organisations. These buildings serving the poor and disadvantaged in the Cape peninsula, Eastern and Northern Cape, are informed by the people that they are built for. The end products reflect the community interaction, but even with this comprehensive process local politics sometimes disrupt use of community facilities.

Other alternative groups like PLANACT (Johannesburg), DAG (Cape Town) and the Building Environment Support Group (Durban), have been working in townships and squatter areas as facilitators and serving a variety of needs. Harber Masson & Associates and Paul Mikula with the Architect's Collaborative in Durban, provide a network of skills from planning to social services, and approach schemes in a collaborative, comprehensive and flexible way drawing from their pool of skills.

Previously 85 percent of Public Works spending went to 10 consultancies. A pilot roster for the appointment of consultants has



Dennis Gilbert



Dennis Gilbert

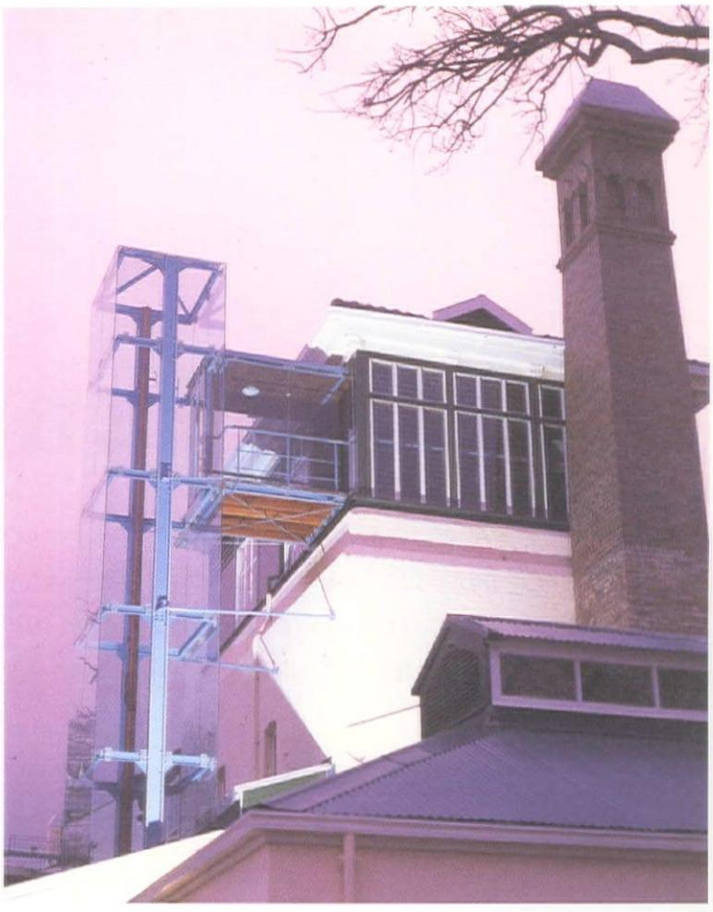
Above *Harber, Masson & Associates. The main office of the Nthlungwane Community Centre located in the informal settlements around Durban's city centre. The original house on the site has been rebuilt under the Informal Settlement Division of the Urban Foundation to provide a social and administrative centre for the community.*
Right *Liebenberg Masojada. Community centre in Zamani, Durban*

now been drawn up as a process of affirmative action, and Asian architects seem to be favourably represented. Jack Barnett however supported a national selection process through a competition system with public approval of designs as the only way of achieving architectural quality and equal opportunity. His commitment to this cause in serving on a review body of the pilot roster, has been prematurely ended by his recent death which is a great loss for architecture in South Africa.

Education and professional bodies

The architecture schools in South Africa presently follow international standards and are likely to be recognised by 1997 by the Royal Institute of British Architects and the Commonwealth Association of Architects. This alignment with international standards however raises questions about the skills cultivation for the changing forms of practice needed to address RDP projects. Also of the six schools only Natal has a good student race ratio. This has been a concern of the Architect's Support Group (previously Architects Against Apartheid) and in consultation with the ANC government suggests a support system that might not compete with schools, but facilitate alternative routes. There are no preconceptions about the structure and form of such a system but it will be based on the Freedom Charter principles and will be the result

Dennis Gilbert



Above *Harber, Masson & Associates. Community hall, Maputaland.*

Right *A new Visitors Centre at South African Breweries in Newlands, Cape Town, by the country's restoration guru, Harvey Fagan. The nineteenth-century Mariendahl Brewery with malthouse and kilns have been incorporated in a new scheme that recontructs the history of beer-making in South Africa. The old buildings were linked up with a hi-tech spine that includes the lift that is juxtaposed with the vertical gravity driven brewery*

of real research of the needs of the new state and be at the cutting edge as the country develops. Concerns of many students who in discussion with a recent RIBA/CAA Visiting Board expressed the desire to be prepared for practice internationally as well as at home, will receive attention.

Negotiations between registration bodies and the government are also under way to review NVQ standards based on competencies. The government favours such a system that would empower and regulate backyard practitioners.

The South African Council of Architects regulate registration of architects with around 2,400 members at present. Should levels of NVQ be administered by the same body it might rise above 20,000. Institutes have become voluntary in 1995 with a loss of around 600 members nationally. Architects generally favour this move to encourage free associations to represent special interest groups gathered under the national body (South African Institute of Architects). Disinterested architects however might have to face up to a Council that will demand re-registration subject to mid-career advancement. Eleven regional institutes have been established incorporating the nine "new" provinces created by the government and smaller regional groups like the Pretoria region. The Association of Black Architects (ABA) have been formed by 14 established black architectural firms in 1993, with a "concrete vision to bring particular, creative and delivery skills, to enable corrective action, for people to be empowered equitably".

Overseas interest

For foreign architects who wish to practice in South Africa, registration is a requirement that will require recognised degrees and professional practice examination. Associations with SA firms would also facilitate practice. Joint appointments encouraged by the government and Olympic Bid Committee combine experience with previously disadvantaged architects and have become known as affirmative action appointments. Jo Noero is however concerned about multi-national cooperation leading to a large outflow of much needed foreign exchange and, unless they are carefully managed, there will be no skills transfer.

Successful entries into the country have been made and Broadway Malyan Africa celebrated their first successful year in practice in July 1996. They incorporated MSC Architects and have since broadened their client base over a broad spectrum including the Johannesburg Housing Company, Johannesburg Public Works Department and Johannesburg Transitional Metropolitan Council that shows public sector involvement, as well as an impressive list of corporate and private sector work. They are further encouraged with expanding opportunities in Sub-Saharan Africa and the Pacific Rim now opening up and see their future in retail and leisure developments. Strategic alliances have been formed, of note with The Jerde Partnership who specialise in retail theme architecture and Linda Mvusi, an urban designer, to provide a broader base of knowledge and skills.

In conclusion

Architects and the construction industry have a constructive and significant role in building the new South Africa through the RDP. Revel Fox, interviewed in this report, believes the opportunities to be enormous because of the need to significantly remodel and reshape apartheid cities.

Although meeting the needs of the community will be a slow process with initial input from strategists and planners being vital, the challenges and opportunities have never been greater. Increased spending power of the community and township potential must infuse the private sector with optimism. A new architecture to mirror the charisma and sheer achievement of President Mandela and the ANC meeting the needs and aspirations of a united nation is the prize. This will however require long term commitment from all concerned. This is no place for hit and run merchants!

If South Africa solves or moves to solve its problems effectively, it should become a shining example and so continue to contribute to the international field so astounded by its political miracle. **WA**

World Architecture *would like to thank the many people who have contributed to this article, including Jack Barnett, Terry Bracher, Pieter de Beer, Julian Cook, Revel Fox, Glen Gallagher, David Glennie, Rodney Harber, Rod Lloyd, Peter Malefane, Jo Noero, Ivor Prinsloo, Peter Ahrends, Glen Robinson and John Rushmere.*

The accidental politician

Revel Fox practised architecture in South Africa for over 40 years before he entered politics. He claims that the Reconstruction and Development Programme (RDP) provides an opportunity for major new developments in health, welfare and housing. He told Pieter de Beer Editor of *Architecture SA* that if the right minds can be focused on providing appropriate and effective solutions, they could set examples that would benefit the developing world.

How has the practice of architecture been affected by the political evolution in South Africa?

I think architectural practices are very much affected by political change. Affirmative action will impact on all aspects of the building industry and that will include the building professions. There are problems with the number of previously disadvantaged professionals available to comply with the demand for integrated professional groupings and there will be problems about the choosing and appointmenting of appropriate consultants. I hope we can find a satisfactory response to them.

Considering the current, position can architecture or the architect be apolitical in the present environment?

I don't think architecture is ever politically neutral. I went to Sweden in the 1950s because the policies of their government at the time encouraged an enlightened development programme which produced some of the finest buildings for health welfare and education the world has seen. The architecture we produce is very much the consequence of the social and political context in which it is built.

So what made you decide to embrace that "political context"?

I was asked to stand as a councillor because there was a need to encourage the breaking of the racial mould in politics and that my experience and skills could make a contribution in local government. Although I have never had political aspirations, it was a request that was difficult to refuse. I was not elected as a "ward" [area] representative, but through the proportional representation list. As a councillor, I serve on the Urban Planning Committee.

The disadvantages are the amount of time it takes from my practice and possible conflicts of interest. The advantage, if any, is the influence that could be exercised in planning and building issues. It is too early to say how it will work out but I may be able to achieve more in local government as a politician than as a consultant.

How do you feel about the socialist agenda of the architecture of the modern movement – is there a change in the response to architecture with the emergent democracy?

Like most students in the forties, I trained in a school strongly influenced by the Bauhaus. My teachers were trained at the AA in London. But I have reservations about the ability of the modern movement to cope with many of the design problems encountered in building in close proximity to distinguished neighbours. The architecture that I see being built now seems to be far removed from any response to a current social agenda. It is however, important that architects and urban planners working within the Reconstruction and Development Programme (RDP) do become seriously engaged in designing for the poor as well as for the affluent.

What type of redevelopment would you suggest regarding problems of urbanisation and urban degeneration?

Well, they tell us that urbanisation is an inevitable and irreversible process, so we should focus on attracting migrants to smaller and medium sized towns in order to relieve the growing pressure on a few large cities.

Does your present work, or other work that you are familiar with, offer any solutions?

The proliferation of fenced and gated communities is one rather sad consequence of the trend towards greater safety and security. As housing and building costs appear to be rising disproportionately to incomes the message that seems to be coming through is the need to reduce the time needed for design and construction and to make buildings that are more economical to build and to run.

Could you explain the decentralisation of business interests?

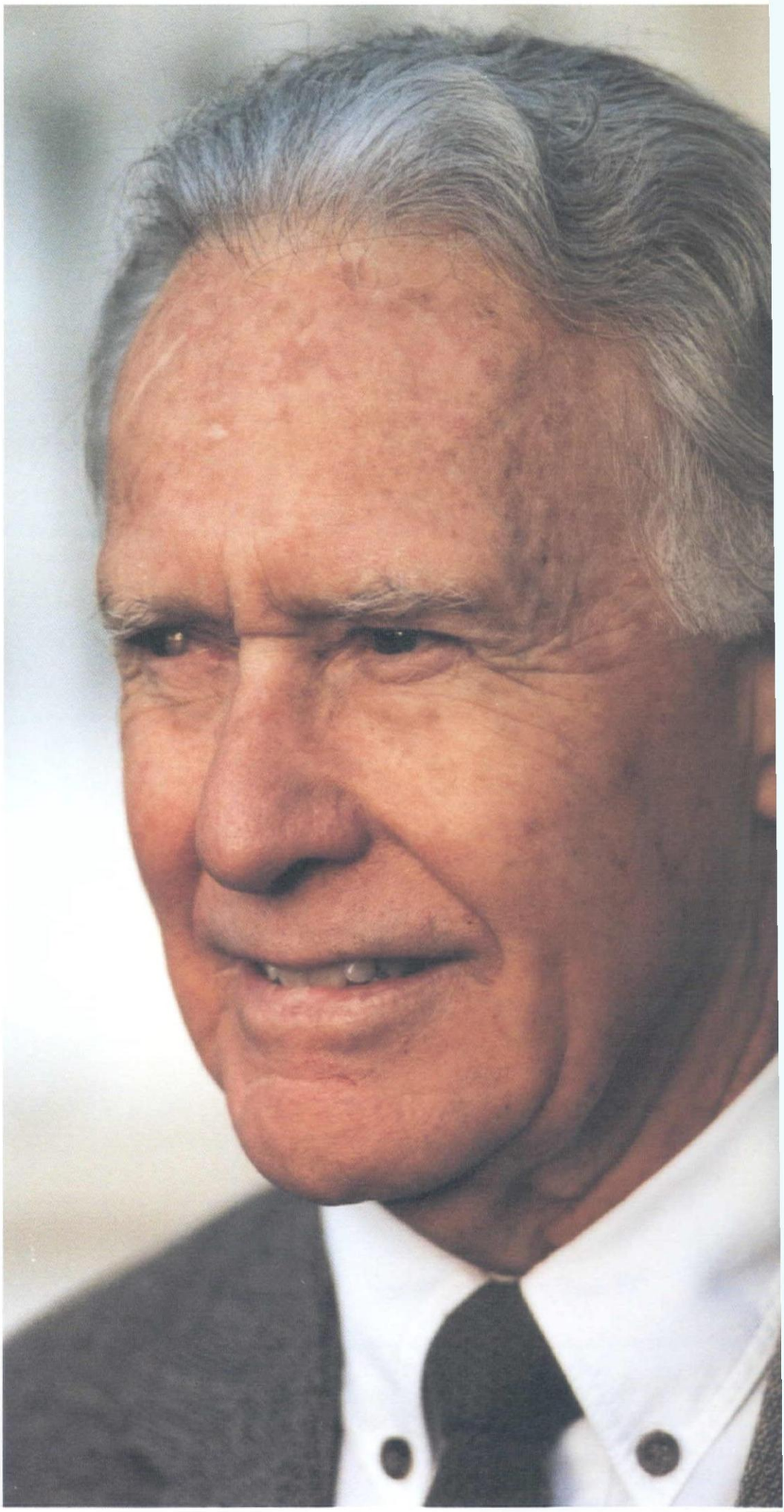
Yes, it is significant that most major banks have continued to locate their head offices in downtown Johannesburg, which is the most accessible place for both present and future personnel and customers. The exodus from cities of business headquarters will not in itself diminish the importance of central cities. With good management and enlightened local government, inner cities will, I believe, regain their prime status in South Africa.

Have you any suggestions as to how the problems caused by the apartheid era's racial zoning policy can be remedied?

The removal of apartheid laws is not in itself enough to remedy the problems they caused. The remedy requires a conscious redistribution of new development, economic activity and amenity. It also requires a new approach to urban housing in integrated planned communities and a transportation network that will effectively reconnect the divided city.

District Six [in Cape Town] is a special

"It is important that architects and urban planners working within the RDP do become seriously engaged in designing for the poor as well as for the affluent."



Eric Miller

problem. There are many who believe it should remain a scar as a visible reminder of an awful wound that was inflicted on the anatomy of the city. Others believe its most useful function would be to recreate a large and high concentration of affordable urban housing. There are good examples of this that have been erected in the vicinity. Whether in time the lively economic corridor that was Hanover Street and the many institutions that enriched that community can be recreated is anyone's guess.

During the apartheid years you declined a lucrative commission in District Six. Can you explain this?

It has always been our practice to decline commissions when we did not feel we could give them our full and unqualified support and there could be various reasons for not getting involved. Some decisions were difficult, particularly when work was very scarce, but we had no misgivings about not working in District Six.

What do you see as the needs and opportunities for architecture today?

The real need is to find a way to avoid the consequences of a massive development programme which is built as a response to crises with insufficient funding and with inadequate design skills. The opportunity is to correct imbalances, eliminate the poverty traps, reunite the divided cities, in effect to rebuild South Africa. When I recall how important the role of the architect was in welfare programmes in Europe, I look forward to our own consultants fulfilling a definitive role in our own RDP. **WA**

Building in the Republic of South Africa

GENERAL INFORMATION

Located on the southern tip of the African continent with an area of 1,221,040 square kilometres, South Africa is bordered on three sides by ocean. The Atlantic on the west, and the Indian on the south and east provide a coastline over 4,300 kilometres long. Land neighbours include Mozambique and Swaziland to the east, Namibia to the north-west, and Botswana and Zimbabwe to the north. Lesotho is an independent country surrounded by South Africa.

The Drakensberg Mountains run south-west to north-east paralleling the Indian Ocean. Beyond them to the north-west lies a large central plateau (veld), which comprises most of South Africa.

There are now nine provinces: Northern Transvaal, Northwest, Northern Cape, Eastern Cape, Eastern Transvaal, KwaZulu-Natal, Orange Free State, Western Cape, Gauteng.

Climate: The northern and central provinces are temperate with cold winters, but no snow. The eastern province is warm and humid with mild winters. The Western Cape has a Mediterranean climate with hot dry summers and cold wet winters.

Average temperatures (minimum/maximum)

	January	July
Pretoria	16°/27°c	3°/19°c
Port Elizabeth	16°/26°c	7°/20°c

Precipitation: Though bordered by oceans, South Africa has a dry climate. Annual rainfall for much of the country is less than 500mm. Rainfall is more plentiful along the eastern coast with annual amounts of 1,000mm. The Namib Desert in the west receives almost no rain.

Population: 43.5 million, urban (60%), rural (40%)

Language: There are eleven official languages. They are Afrikaans, English, Ndebele, Pedi, Sotho, Tsonga, Swati, Tswana, Venda, Xhosa and Zulu. Most commercial documents are printed in both English and Afrikaans.

Ethnic Composition: Black (75%), White (14%), Mixed (9%), Asian (2%)

Religious Affiliation: Predominately Christian (Protestant with a Roman Catholic minority) with Hindu and Moslem minorities.

Capitals: Pretoria (administrative), Cape Town (legislative), Bleomfontein (judicial). There is a lobby to move the parliament from Pretoria to Cape Town.

TRAVEL & BUSINESS INFORMATION

Time Differences: South Africa is 2 hours ahead of Greenwich Mean Time (GMT) and 7 hours ahead of Eastern Standard Time (EST).

Currency: Rand, which divides into 100 cents.

Business Hours:

Business:	8:00/8:30 to 5:00, Monday - Friday
Banks:	9:00 to 3:30, Monday to Friday
	9:00 to 11:00, Saturdays
Shops:	8:30 to 5:00, Monday to Friday
	8:30 to 1:00, Saturdays
	(most supermarkets remain open until 5:00 pm)

National holidays:

January 1	New Year's Day
March 21	Human Rights Day
April 27	Freedom Day
May 1	Worker's Day
June 16	Youth Day
August 9	National Women's Day
September 24	Heritage Day
December 16	Day of Reconciliation
December 25	Christmas Day
December 26	Day of Goodwill

Variable Holiday dates:

March-April	Good Friday
March-April	Family Day

Airport Information: Johannesburg International Airport approximately 20 kilometres from Johannesburg is the major international airport. Other airports with international traffic are Cape Town International Airport near Cape Town and Durban International Airport near Durban.

Dialling Code: South Africa's dialling-in code is 27. The international dialling-out access code is 09.

Economic data

South Africa is the largest and most advanced economy in Africa. Initially based on gold and diamond mining, the economy has diversified over the last 50 years and is now broadly based. South Africa's prolonged recession of more than four years bottomed out in 1993, when the economy recovered somewhat to register 1.1 percent growth.

Consumer Price Index: 1990=100

1991	1992	1993	1994	1995 (est)
115	131	144	157	171

Exchange Rates: Rands per US$

1991	1992	1993	1994	1995	1996(June)
2.74	3.05	3.40	3.54	3.65	4.34

GENERAL CONSTRUCTION INFORMATION

Construction Outlook: A construction boom is expected with the redevelopment programme of the country. These expectations are the result of a shortage of housing, the development of the tourist and leisure industry, airport construction and upgrading schools and hospitals. Increased foreign investment will play a large role in the redevelopment programme.

Rates of Inflation: The rate of inflation in the construction industry is approximately 20% per annum. This compares with the national inflation rate which is about 9%.

Procurement of Construction: By African standards, the construction industry is well organised, developed and capable of carrying out major construction projects. The traditional method of procurement involves the owner appointing a professional team consisting of an Architect, Structural Engineer, Mechanical and Electrical Engineer and Quantity Surveyor. After the drawings and specifications are ready, but not complete, the quantity surveyor prepares a Bill of Quantities, which is used as a bid document to receive competitive bids from construction companies. The typical bid documents include:

- Form of Tender and Tender Instructions

- Form of Contract
- Bills of Quantities and Specifications

It is normal to issue only a few drawings to the Contractors for their inspection. Drawings are not typically complete at tendering. Typically, the successful mechanical and electrical subcontractors complete the design under the supervision of the engineers.

In recent years the approach has been somewhat changed by the arrival of construction management firms who now use the US system of project and construction management. Various large international investors are using this method. Most large projects will use the fast track approach.

The various professional bodies and the Master Builders' Association (MBA) together have numerous forms of contract that cover the full range of building construction. It is common for construction contracts to include fluctuating price clauses due to the rate of inflation in the industry. Penalty and bonus clauses are often included in contracts.

Design Professions: Professional institutes regulate the architectural, engineering and quantity surveying professions. The institutes control qualification and professional behaviour. Apart from civil engineering projects, the architect is the team leader for the design process, including handling planning permission work on the behalf of the owner. Most South African architectural firms only practice architecture. The owner usually appoints and holds contracts with the Structural, Mechanical, Electrical and Civil Engineers directly. The Quantity Surveyor typically prepares the specifications.

Contractors: Major contractors are usually members of the Master Builders' Association. Several large contractors operate on a national level. General contracting is the normal practice in South Africa. Subcontracted work may be as much as 70% of the contract. For specialist trades (eg mechanical, electrical, plumbing, elevators) it is usual for the owner to appoint subcontractors (nominated subcontractors).

Governing Codes & Standards: The Standard Building Regulations provide the design codes for South Africa. They may be obtained from the South African Bureau of Standards. Material quality is governed by the South African Bureau of Standards. Material standards are generally similar to British standards.

CONSTRUCTION MATERIALS AND METHODS

Materials: All materials are readily available in South Africa. The trade sanctions imposed for many years during apartheid resulted in a significant capacity to manufacture materials locally. Speciality materials requiring import are generally imported from Europe, particularly Germany, Italy and Great Britain.

Labour: Labour is generally available for most trades, but shortages are experienced in highly skilled trades such as joinery and shopfitting. A significant amount of the construction labour force is organised into trade unions.

Equipment: All construction equipment is readily available. The major contractors own their own plant and equipment.

CONSTRUCTION COST GUIDES (1996)

Pricing Manuals: Cost guides are available from the Institute of Quantity Surveyors, from professional Quantity Surveying firms or from construction management firms.

Approximate Construction Costs: The following square metre unit rates for the Durban areas are provided for rough construction purposes:

Building Type	Rand/square metre
Warehouse	1,200-1.350
Office Building	2,300-2,800
Hotel, 5 Star (excl. FF&E)	2,650-4,200
Housing, Luxury	2,500-2,700

USEFUL ADDRESSES

Institute of Architects
PO Box 2093
Houghton 2041, S.A
Tel: +27 11 486 7683
Fax: +27 11 486 0692

Association of Quantity Surveyors
PO Box 3527
Halfway House 1685, S.A
Tel: +27 11 315 4140
Fax: +27 11 315 3785

Institute of Structural and Civil Engineers
PO Box 93495
Yeoville 2143, S.A
Tel: +27 11 648 1184
Fax: +27 11 648 7427

Institute of Electrical Engineers
PO Box 93541
Yeoville 2143, S.A
Tel: +27 11 487 3003
Fax: +27 11 487 3002

Institute of Mechanical Engineers
PO Box 93395
Yeoville 2143, S.A
Tel: +27 11 648 1322
Fax: +27 11 648 1387

Building Industries Federation and Master Builders Association
PO Box 1619
Halfway House, S.A
Tel: +27 11 315 1010
Fax: +27 11 315 1644

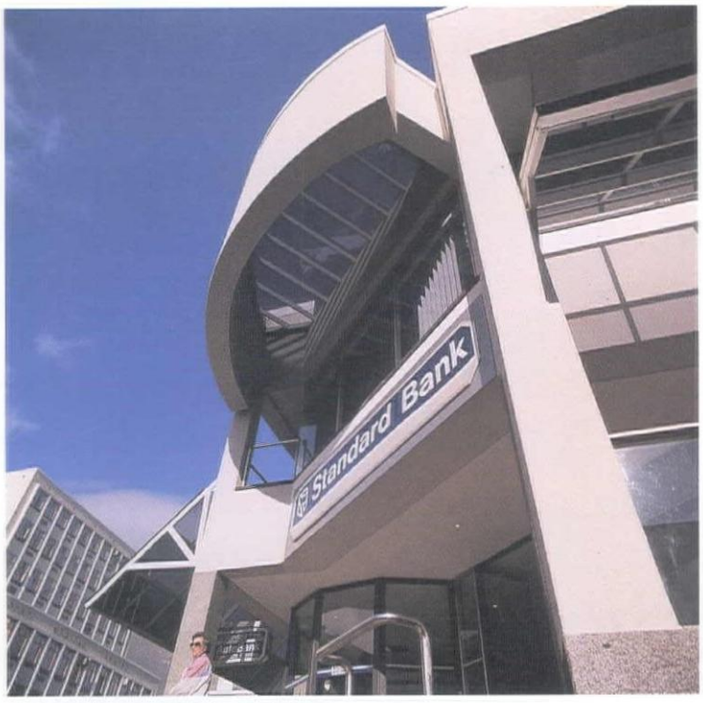
South African Bureau of Standards
Private Bag x 191
Pretoria 0001, S.A
Tel: +27 12 428 7911
Fax: +27 12 344 1568

World Architecture *and* Hanscomb *wish to thank Dudley Will in South Africa for assisting in the presentation of the information in this Country Report.*

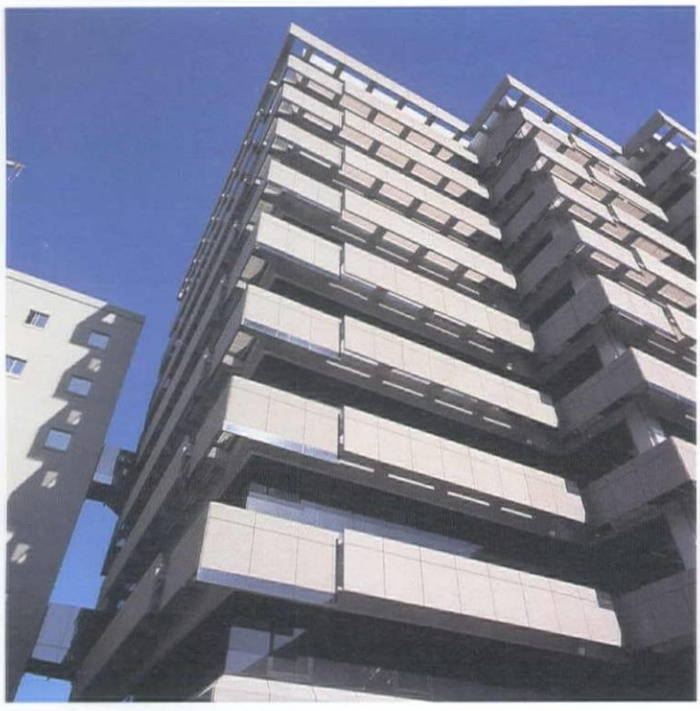
South Africa – Major architectural practices/design firms

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

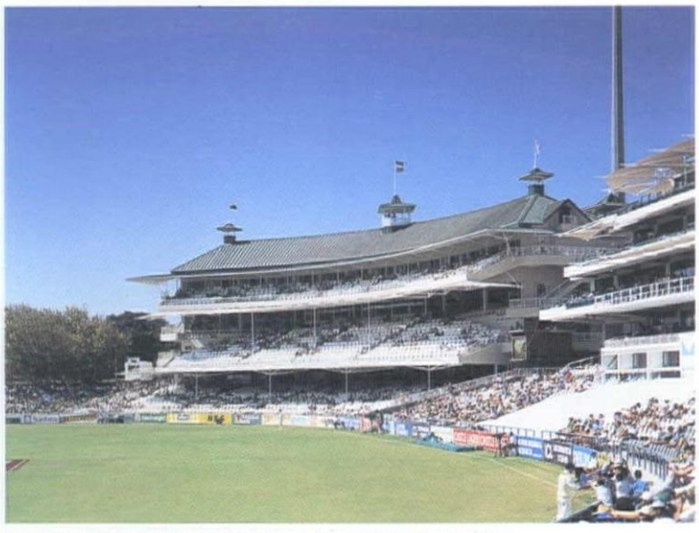
Architectural practice / design firm	Total architects	Total staff	Total offices	Area of Specialisation: Health care	Industrial	Commercial	Office buildings	Housing / Residential	Religious / Cultural	Planning	Interiors	Sport / Leisure / Recreation	Hotel / Restaurant	Education	Laboratories / Research	Transport	Other
THEUNISSEN JANKOWITZ SA INC	34	101	12	•	•	•	•	•		•	•	•	•	•	•	•	•
Gap Architects & Urban Designers	30	62	2			•	•	•				•	•	•	•		•
Osmond Lange Mosienyane Architects & Planners	25	71	10	•	•	•	•	•		•		•	•	•	•		
Winterbach Pretorius White Architects	25	120	12	•	•	•	•	•		•	•	•	•	•	•		•
KMH Architects cc	15	28	1	•	•		•	•				•		•			•
F.G.G. Architects	14	43	2	•			•					•	•	•			
Stefan Antoni Architects	14	22	1			•		•			•	•	•				
Mwamuka Mercuri O'Malley Moses Inc	11	27	1		•	•	•	•						•		•	
Burg Doherty Bryant & Partners	10	35	2		•		•	•		•	•	•	•	•	•		•
Edge Harper Hook Cunningham + Shererhagen	10	30	3	•	•	•	•	•			•	•	•	•			
Meyer Pienaar	10	25	2	•	•	•	•	•			•	•	•	•	•		•
Africa Associated Architects cc	8	19	3		•	•	•	•			•	•	•	•		•	•
Elphick Proome Architects	8	21	1	•	•		•	•						•			
Harold H. Le Roith & Associates Architects	8	13	2	•	•	•	•	•		•	•	•	•	•	•	•	
Johnson Murray Architects	8	15	1		•	•	•					•		•			•
LVM Architects	8	25	5	•	•	•	•	•		•	•	•		•	•		
MV3 Architects (Pty) Ltd.	8	30	2		•	•	•	•		•	•	•	•	•		•	
Goldblatt Yuill and Partners	7	20	4	•	•	•	•						•	•			•
Ing Jackson Architects	7	12	1		•	•	•	•				•	•	•	•		•
Fassler Kamstra and Holmes - Architects	6	9	1				•	•		•	•		•	•		•	•
Portal Partnership Incorporated	6	15	2		•		•					•		•			
Roberts & Loebenberg Architects	6	45	1	•	•	•	•				•	•					
ZAI Incorporated	6	97	4	•	•	•	•	•		•		•	•	•	•	•	
A3 Incorporated Architects	5	10	1	•		•	•	•					•	•			
AFA Architects	5	15	3	•		•	•	•				•	•	•	•		•
Marais, Pretorius - Wenhold Architects	5	9	2	•			•	•					•	•			
Marais, Du Plessis & Mentz	5	8	2	•	•	•	•	•		•	•			•	•		
Meirelles Lawson Archtiects	5	10	1			•	•	•				•	•				
Otten and Louw Architects	5	12	1		•	•	•	•					•				
Schalk Vorster Naudé Architects	5	25	2	•	•	•	•	•		•	•	•	•	•	•	•	•
Simpson Ackerman & Mguga Architects cc	5	18	1	•	•	•	•	•		•	•	•	•	•			
Tasker & Schumann Architects	5	9	2	•		•	•						•				
W M Swart and Partners cc	5	11	1		•		•	•						•			
Nel Wilreker Partnership Inc	5	12	1	•	•	•	•	•		•		•	•	•	•		•
ALA Architects	4	8	2		•	•	•	•				•				•	
Axion Architects	4	9	1		•	•	•	•		•			•				
BI Associates	4	17	1				•	•		•	•						•
H. Bohm & Partners	4	5	1	•	•	•	•	•					•	•			
Brinkman van Rooyen Architects	4	9	1	•	•		•	•						•			
Du Toit Kenealy Du Toit cc	4	15	1	•	•	•	•	•		•				•			
Kilein & Louw Architects.	4	13	1					•			•	•	•				
Linda Mvusi Architecture & Design cc	4	6	1			•	•	•						•		•	
Naudé & Bouma Architects	4	5	1	•	•	•	•	•				•	•	•	•		
Osglo Architects (Pty) Ltd.	4	10	5	•		•	•					•		•			•
Paul Berends Associates	4	8	2	•	•	•	•			•			•	•	•		
Richard Tremeer Architects	4	7	1		•	•		•			•		•				•
S.W.S. Architects	4	17	2	•				•				•	•	•			
Wim Phielix & Sadie Architects	4	10	4	•	•	•	•	•				•	•	•	•	•	



Standard Bank, Cape Town, South Africa



Mutual Park, Cape Town, South Africa



Western Province Cricket Club Pavilion, Cape Town, South Africa

KMH ARCHITECTS

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Cape Metropolitan Council

Key Personnel

Partners:
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Glen Loudon ARCH.SA M.I.A. R.I.B.A. AA ARB
Andrew Rudolph ARCH.SA M.I.A.
Mark Rosenbaum ARCH.SA M.I.A.
Rod Stevens ARCH.SA M.I.A.

Size of Practice – 28 persons

Practice Profile

Founded in 1912, KMH Architects is built on a firm foundation of professionalism and a proud tradition of the highest ethical standards in the service of our clients.

The firm has won several architectural competitions and has been awarded two bronze medals by the Cape Provincial Institute of Architects. To the profession it has contributed two Presidents in Chief of the South African Institute of Architects and three Presidents of the Cape Provincial Institute of Architects.

The practice commits partner involvement to every project from inception to completion.

The essence of the KMH project management procedures is the simultaneous consideration through al work stages of the three interrelated elements of design, cost and time.

Buildings are designed to be logical and coherent and to fit each client's specific needs. The right KMH team is assembled to fulfil the requirements of each project.

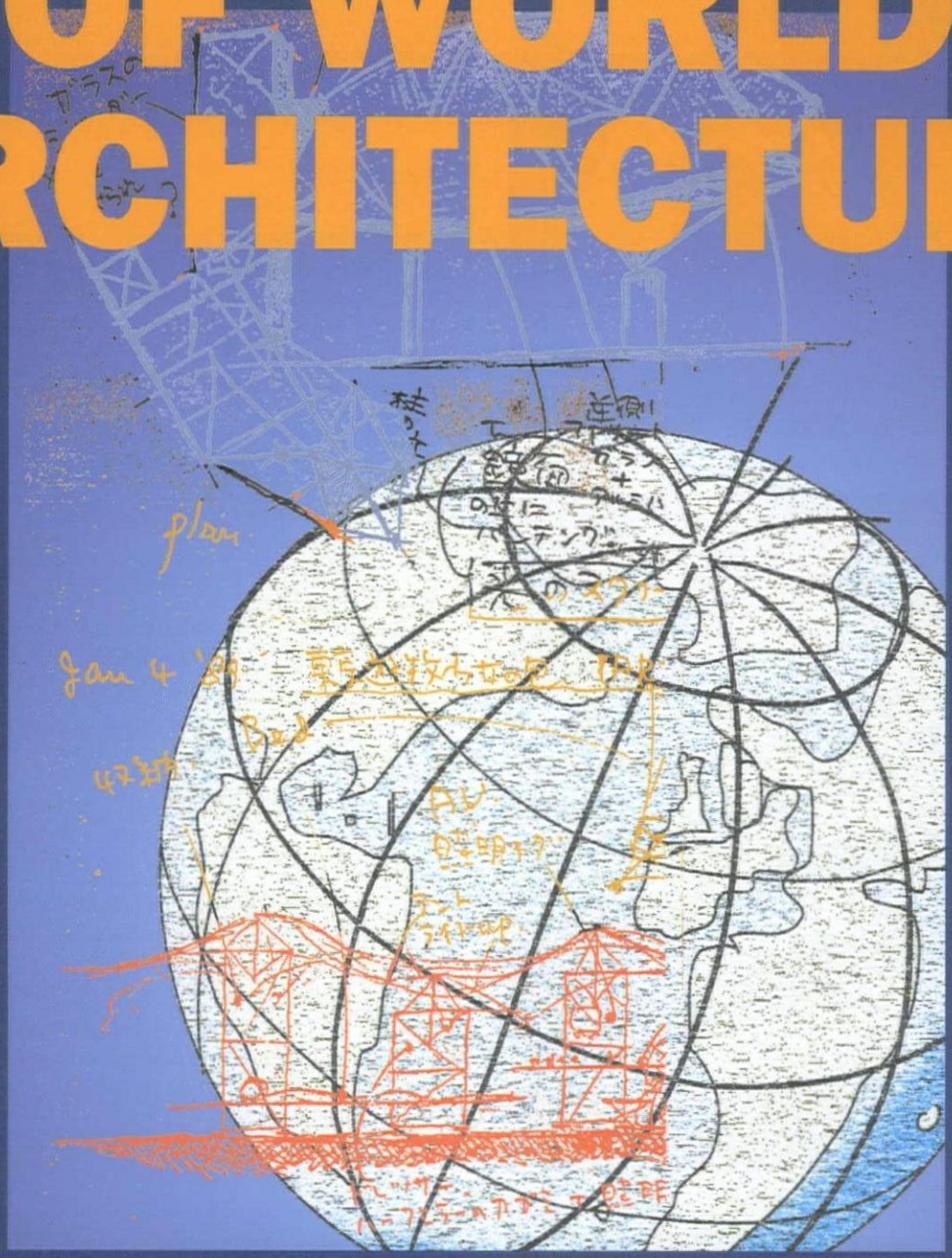
KMH's service philosophy depends on the quality of its staff – and by employing the best people we can provide the best professional service to produce good buildings completed on programme and to budget.

The practice has developed, through experience, a broad range of projects for both public and private sector clients, and provides architectural, urban design and consulting services. KMH's services are enhanced by regular upgrading of its extensive computer and CAD systems.

Areas of Specialisation

Corporate Headquarters, Offices, Industrial Parks, Banks, Retail, Hotels, Housing, Wineries, Sports Pavilions and Stadiums, Refurbishment's and Space Planning.

THE GIANTS OF WORLD ARCHITECTURE



THE ANNUAL SURVEY OF THE WORLD'S TOP 250 ARCHITECTURAL FIRMS

World Architecture's 1997 World Survey of the top 250 architectural firms is based on the largest set of data ever produced.

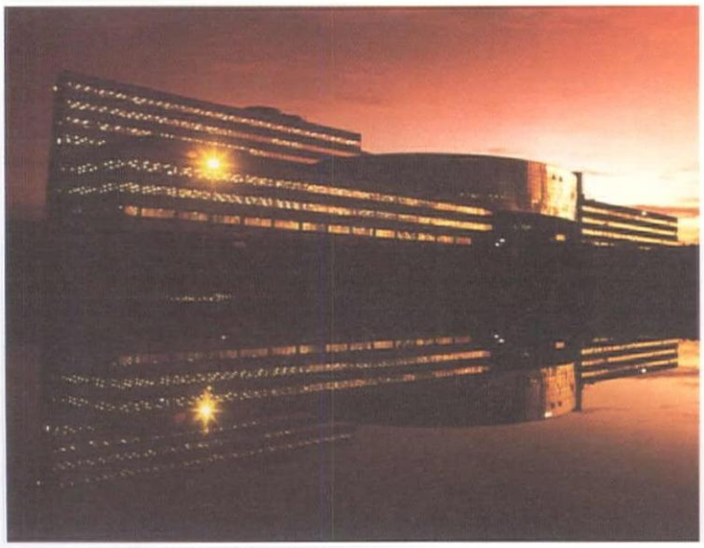
A unique and authoritative survey, it charts a continuing surge in the construction market with some cases of spectacular recovery, and looks at the biggest, best and fastest growing firms around the globe.

Within the detailed data, the survey shows that average fees have increased most significantly in the USA, Denmark and the UK, and that the world's fastest growing practice is based in Malaysia.

The most favoured consultants are listed and trends throughout the construction industry in general as well as within specialist frims are analysed.

The World Architecture 1997 World Survey of the top 250 architectural firms will feature comprehensive details of the largest, most successful and most sought-after architects and engineers in the world.

The World Survey will be included in the December/January issue of *World Architecture*. Don't miss out. Subscribe to *World Architecture* today.



Armscor head office building, Pretoria, South Africa

The Forum at Sandton Square, Sandton, South Africa

Casino at the Lost City Entertainment Centre at Sun City, South Africa

MV3 ARCHITECTS

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Chairman: Piet Moolman
Managing: Greg Pieterson
Stan Segal
Ian Alexander
Gideon van Rooyen
Nick Poulsen
Jean Lombaard

Size of Practice: 30 employees

Practice profile

With more than 40 years experience MV3 is a well established, high profile South African architectural practice. Established in 1969, the result of a merger of previous practices, MV3 Architects is one of the significant architectural and urban design practices in South Africa and has worked in all of the old provinces of South Africa.

MV3 Architects concentrates on contributing unique design solutions, appropriate to each commission. MV3 is convinced that special design ability and talent is the most significant contributor to the creation of great building solutions.

With appropriate and creative design solutions we enhance the whole process of building, from inception to completion. The process is brought to successful conclusion by the application of appropriate contract management and administration skills in which we apply the collective resources and wisdom of the practice.

The MV3 philosophy – seemingly obvious on the surface but requiring innovative management practices in its execution is - "to understand and satisfy the basic needs of its clients".

This MV3 achieves with a group of talented and highly experienced professionals dedicated to maintaining a high standard of architectural design and client service; completing projects within budget and on schedule; careful attention to detailing and material selection; effective management and quality control of projects backed by a multi work station Autocad computer system.

MV3 is committed to principles of quality in all aspects of the practice and continually strives to review and improve the established systems based on feedback from clients, and their perception of the service provided.

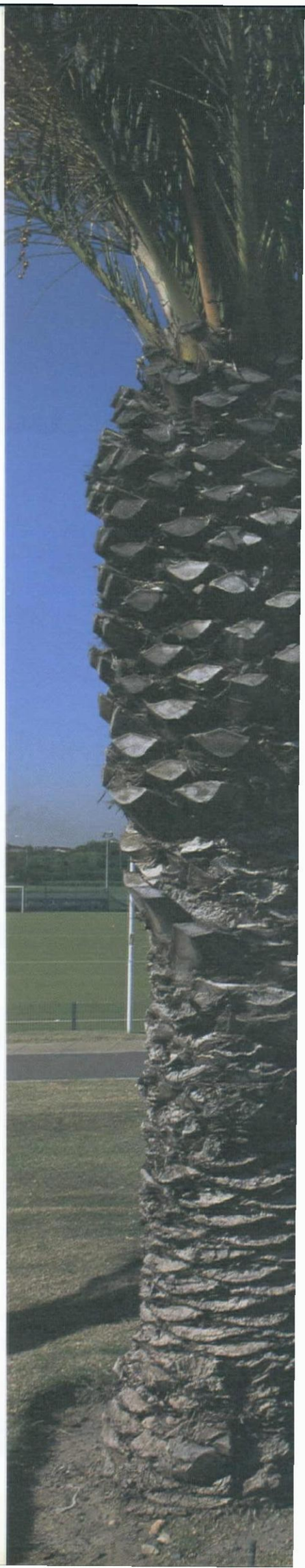
Areas of specialisation

Urban design; hotels, leisure and entertainment; office buildings and office parks; industrial parks and buildings; refurbishments; theatres; Parliament and Supreme Court buildings; educational buildings; project management; interior design.

Olympian dream

Hartleyvale stadium, the home of hockey in Cape Town was identified as the venue for hockey for the 2004 Olympic Games bid, as well as hosting the Women's Hockey Qualifying round for the Atlanta Games of 1996. This project, by GAPP Architects & Urban Designers in association with ACG Architects, is the first of a series of proposed schemes for the Olympic bid for 2004, and the new facility therefore had to enhance Cape Town's status as a potential Olympic host city. The stadium is a pioneering work in South Africa, where architectural and engineering design have worked together with the steel industry to produce a dynamic building expressing and testing the available technology in the country, and instigating a major urban redevelopment at the foot of Table Mountain.

Text: Pieter de Beer, Editor of *Architecture SA*.

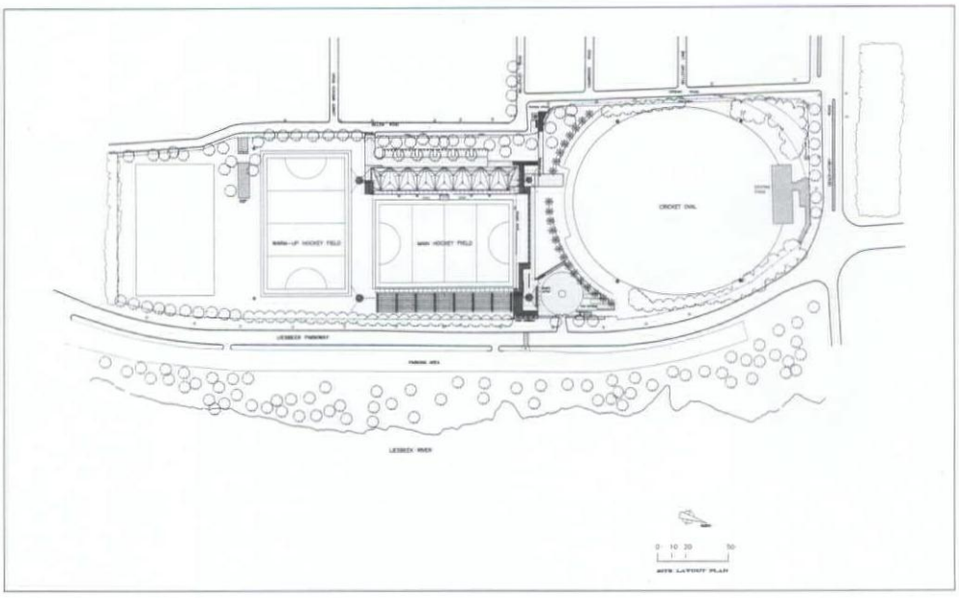


The distinct nature of the site for the new stadium at Hartleyvale, which was effectively both a visual and physical barrier to one of the few green lungs in the suburbs, was welcomed by architects GAPP and ACG firstly by returning Hartleyvale to the residents of Observatory as both a sporting venue and a park-like recreation facility. The site was also linked to the greening of the city programme, thereby contributing to the wider concerns of the city. The various activities available on the site – such as the bowling greens, the swimming pool, cricket, softball and soccer fields – were united into a whole, as opposed to the previously segmented development. The site, although problematic and sensitive, is spectacular, with the Liesbeeck river on one side and a spectacular view of Devils Peak on the other. The design strategy involved the demolition of the high fibrecrete wall surrounding the site and the demolition of the unsightly, derelict stadiums around the soccer field. The wall was replaced with a transparent green fence and the placement and planting of the remainder.

The path linking the residential area to the river has been developed as an entrance spine with the main entrance to the stadium located on the Liebeeck Parkway side. A secondary entrance is located on the residential side and this caters for residents and members of the public arriving by train. The two entrances form a spine, reinforced by newly planted palm trees, which provides access to the grandstand, and the soccer and softball oval.

The 2000 seater stadium itself is conceived as a pavilion within a parkland, sited at the western extremity of the green belt. The building is close to the predominantly residential Observatory area, consisting of small Victorian houses. However, the most common perception of this building is its setting at the foot of Devils Park. The pavilion is 90 metres long. As no building of such scale exists within the green belt, the structure is broken down, and expressed as seven modules, with the roof comprised of eight umbrella structures. This treatment governed the entire construction process and reduced the building to a series of repeated elements as

Previous page *View of the new hockey stadium through the newly planted palm trees, which form a spine connecting all elements of the sports complex.* ***Right*** *The 2000-seater stadium, conceived as a pavilion within a parkland, is located close to the predominantly residential Observatory, in the shadow of the spectacular Devils Peak.* ***Right centre*** *Although, by definition, the pavilion is 90 metres long – by far the largest single structure in the vicinity – it is broken down and expressed as series of seven modules, with eight umbrellas structures expressing the roof.* ***Bottom*** *Site plan*



opposed to a monolith, and enhanced detailing and buildability through repetitive work both on site and off.

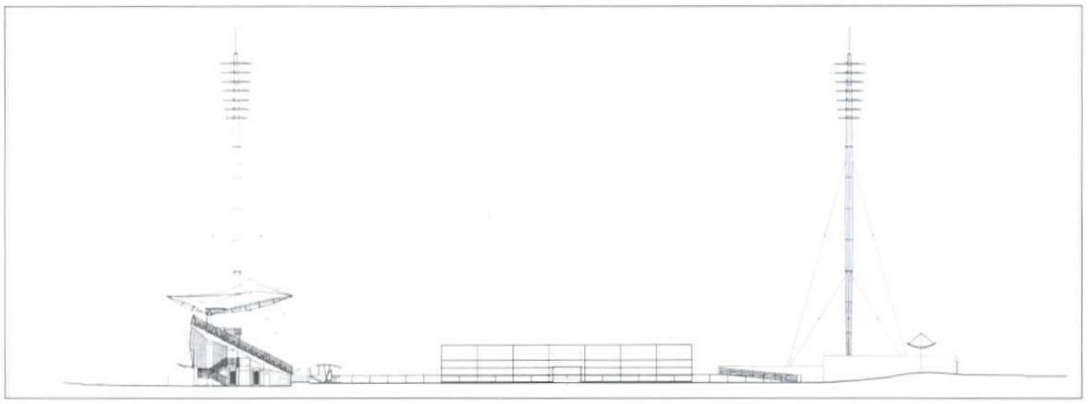
The construction materials become progressively lighter in ascending order: earth to concrete to steel to membrane to sky. The dynamic expression of the membrane roof informed the design direction of the steel and concrete. The building is a legible expression of its structural performance, informed by compositional judgement. There are two foundation systems. The primary system is a series of Piles supporting the primary oval columns which support the raker beams which, in turn, support the seating beams. These columns carry through to support and anchor the roof. Secondary to this system, is a raft foundation which acts as the ground floor. The concrete forms reflect the structural function of each element, hence the oval columns, concave raker beams and "fish bellied" seating beams.

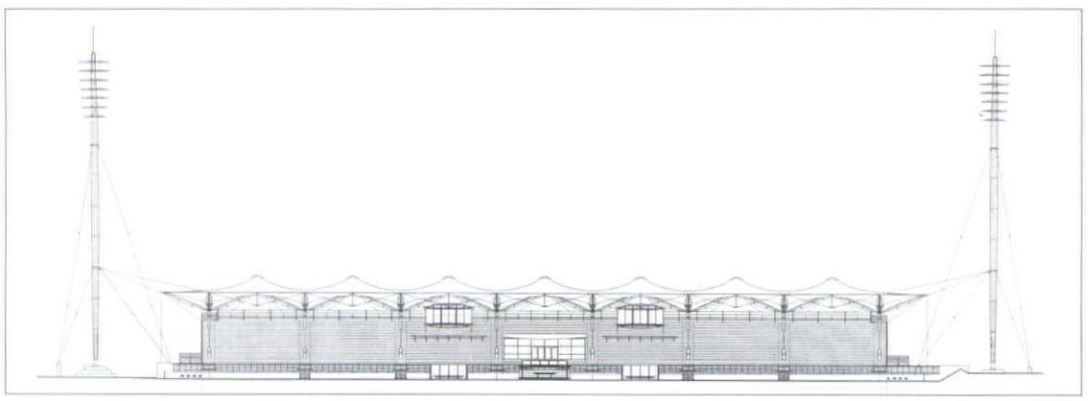
The roof steelwork comprises eight identical tripods, each on a concrete column head. Three booms, two identical to the rear and one longer towards the pitch, are formed from steel pipes made light by the use of outrigging. These booms are held in place by a field of tensile steel members which are, in turn, tied to the precast concrete and anchored by the adjacent light masts.

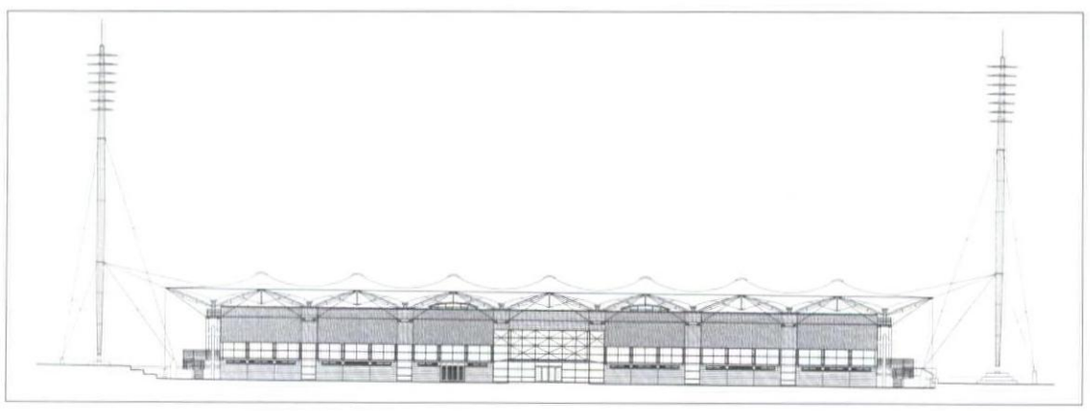
The membrane roof responds to the triangular geometry of the eight steel tripods. The double curvature is generated by vertically distorting the horizontal plane using eight pull-down points at the column heads and seven push up points diagonally opposite. No steel work protrudes beyond the level of the roof, leaving an uninterrupted and undulating fabric surface responding in form to the mountain and the sky.

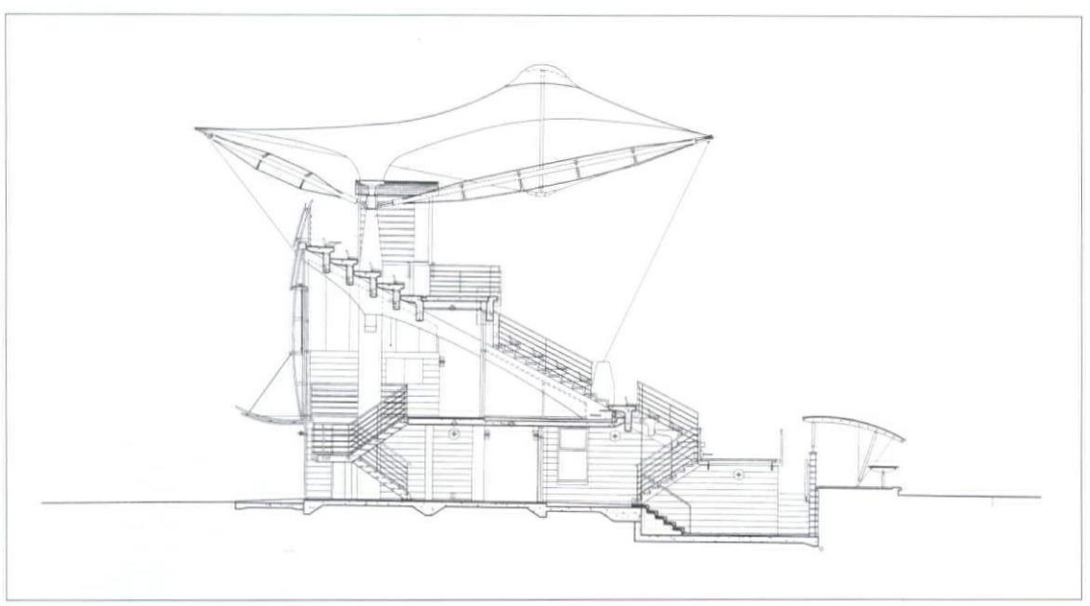
The ground floor beneath the raked seating contains four changing rooms, public toilets and all accommodation required for umpires, drug testing and equipment. The first floor houses offices, press and social spaces. The central bay has been broken down to act as a double height foyer space. At this point the seating beams are omitted and glazing introduced on both pitch side and mountain side to produce transparency and visual links between pitch and mountain, centred on the halfway line.

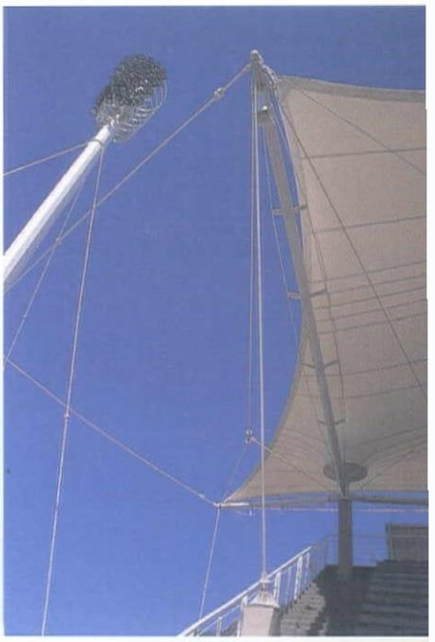
The west or rear elevation is clad using a series of vertical curved steel trusses, their

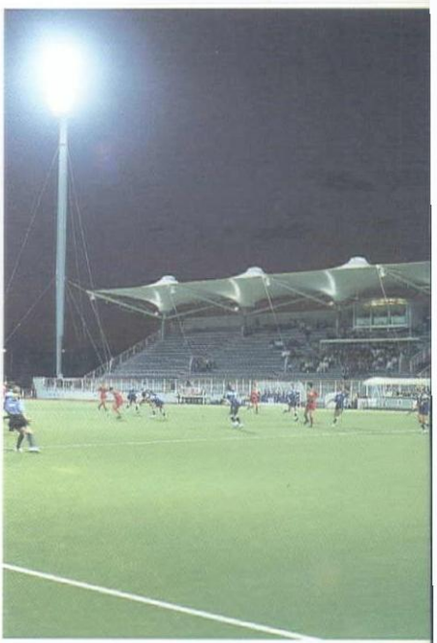






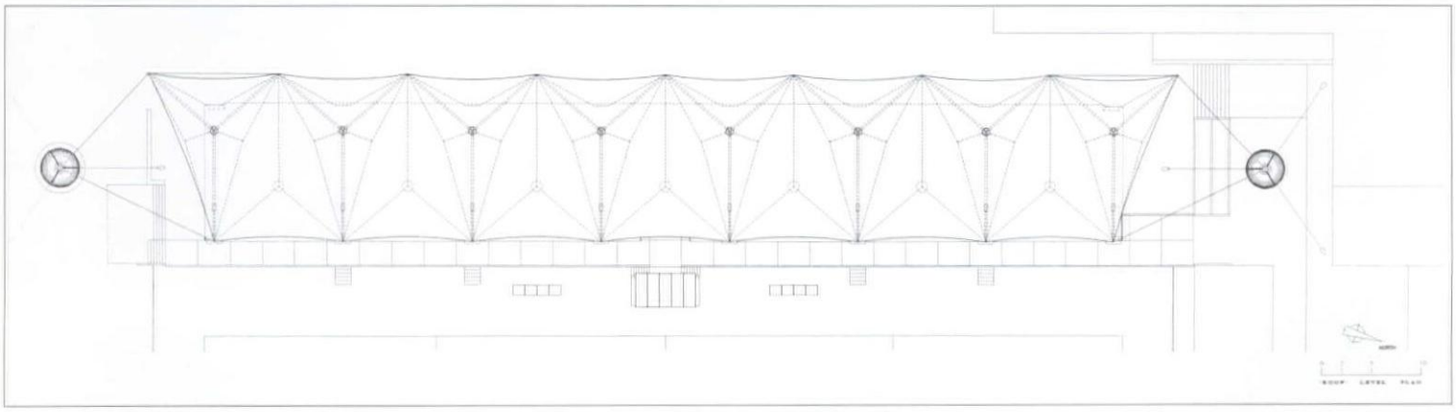


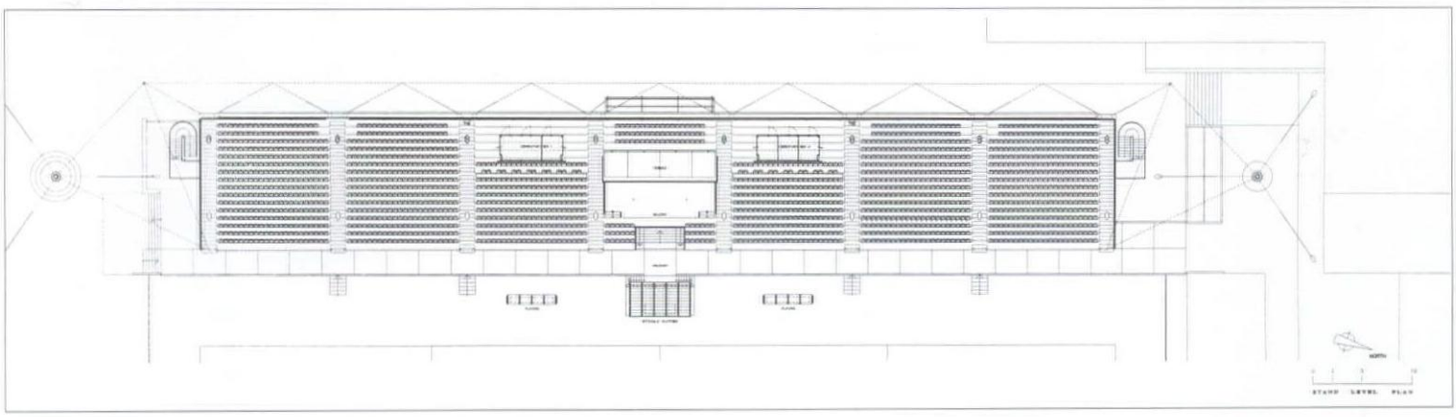


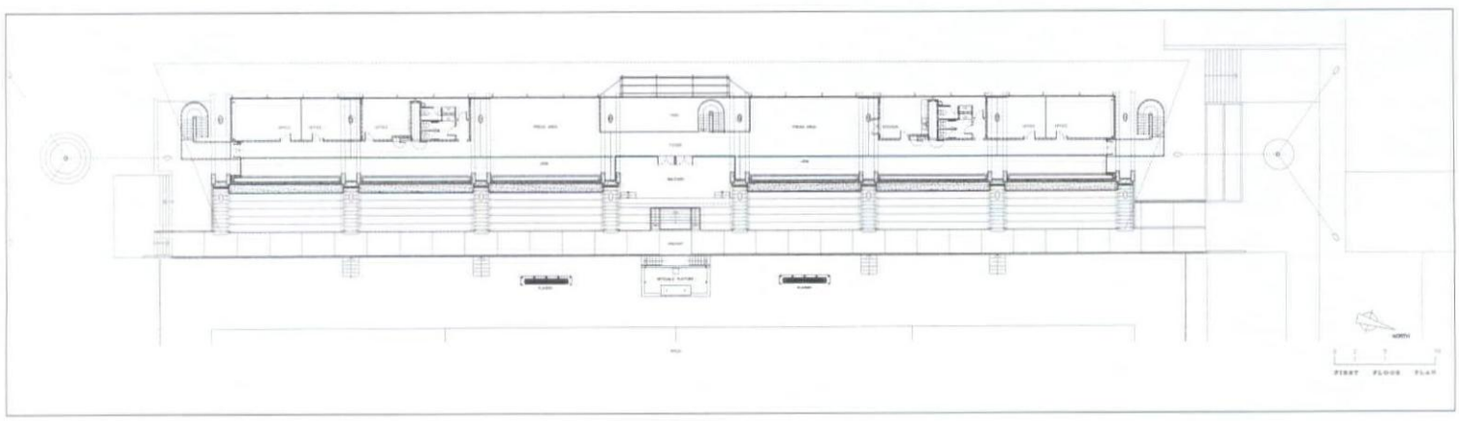


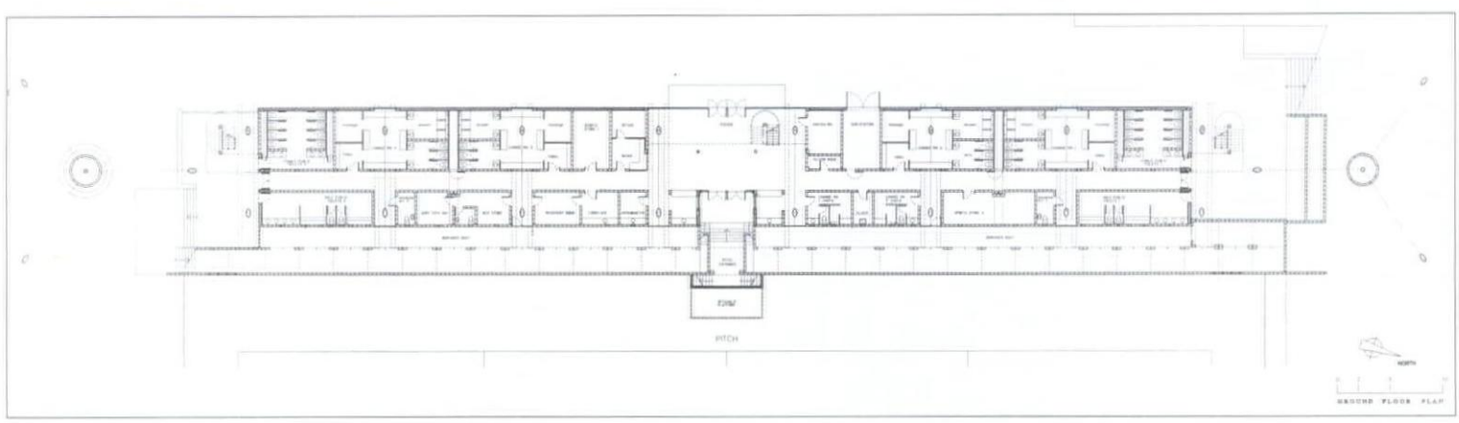
Left from top *South elevation; east elevation; west elevation, and section of the foyer.* ***Top*** *Detail of the structure is based on two foundation systems. The primary system is a series of Piles.* ***Above*** *Night-time shot of the stadium in use, illustrating the undemanding, human scale of the design elements*

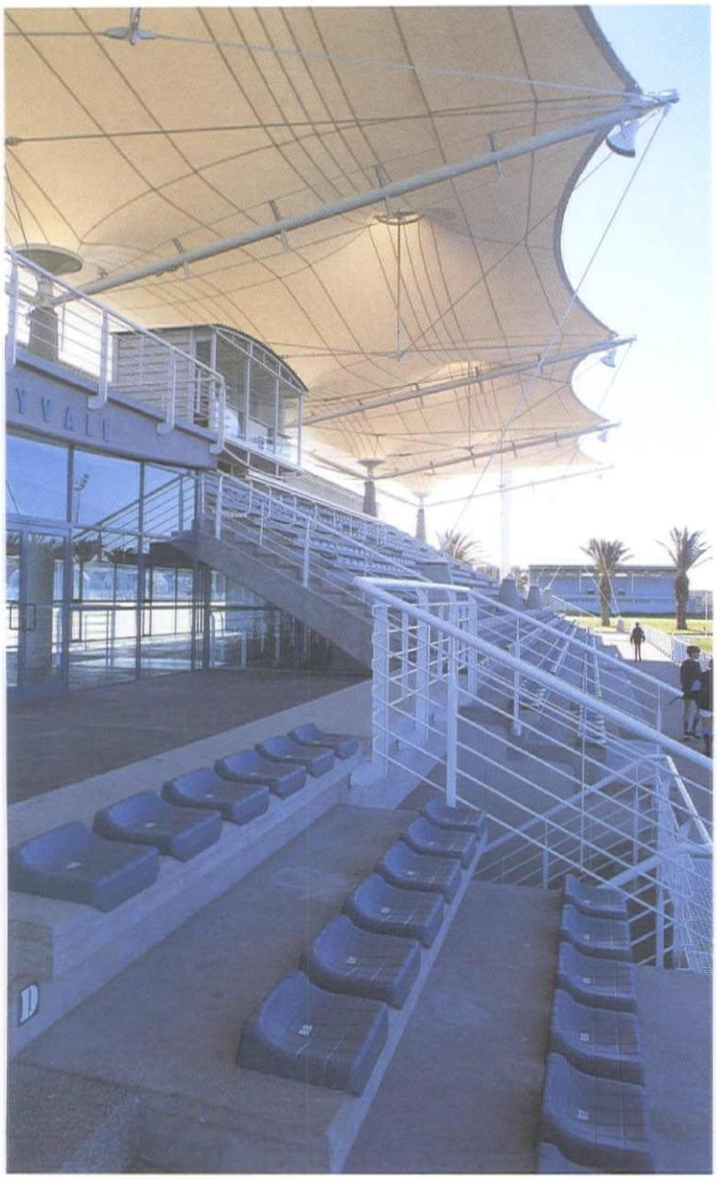
From top *Roof plan; stand level; first floor plan, and ground floor plan*

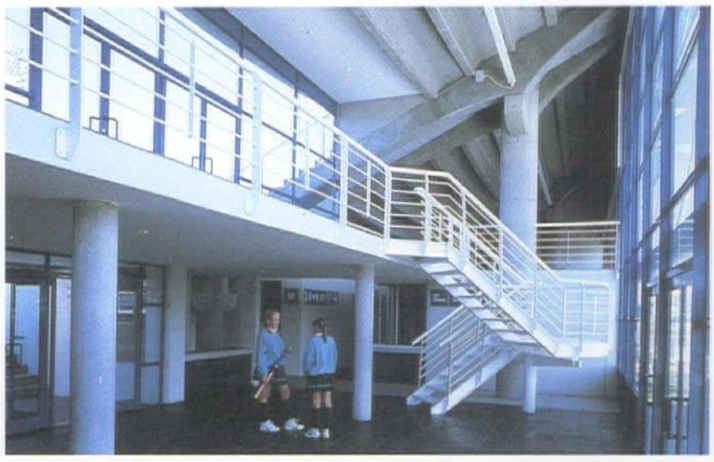












Left *The membrane roof responds to the triangular geometry of the right steel tripods. No steel work protrudes beyond the level of the roof, leaving an uninterrupted and undulating fabric surface responding in form to Devils Peak.* ***Top*** *The first floor houses offices, press and social spaces.* ***Above*** *in the foyer area, which is level with the half-way line, seating beams are omitted and glazing introduced, on both the pitch side and the mountain side, to produce a visual link between the two*

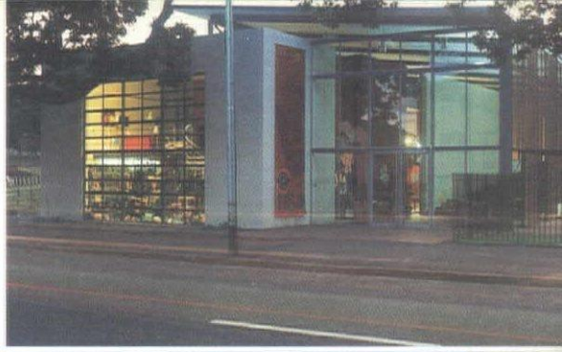
form relating to wind loading, spanning between first floor slab and the back of the highest seating beam. These trusses are clad externally using steel sheeting, leaving a strip of two-metre-high glazing along the entire length of the building. Blockwork is used on the ground floor. This arrangement produces a masonry enclosure for the ground floor, where changing rooms and public washrooms are sited, and a lightweight and transparent enclosure for first floor where offices and social areas are sited.

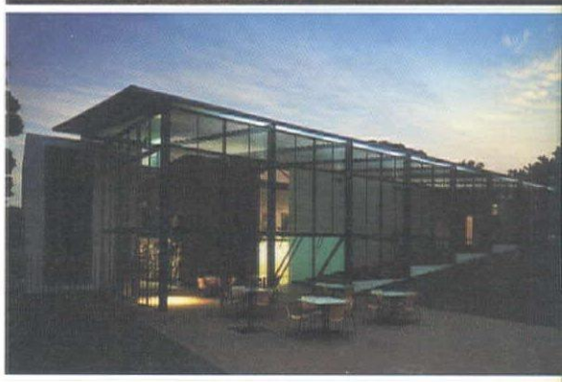
The Hartleyvale Pavilion was conceived as a light-weight articulated structure set in a parkland nestling under Table Mountain. Its proximity to the residential Observatory required particular attention to human scaled design elements. The designers were keen to display all construction materials used, revealing their qualities by the nature of their design. Steelwork played an essential role in the architectural expression of the building. Being a light and expressive material, steel responds well to articulation. The engineers and architects produced a design expression of tension and dynamics, characteristic of Olympic sporting contest. **WA**

Project	Hartleyvale Hockey Stadium	**Membrane analysis**	Arup Inc
Client	Cape Town City Council	**Landscape architects**	OVP Associates
Architects	GAPP Architects & Urban Designers in association with ACG Architects	**Main contractor**	Concor Western Cape
		Precast concrete sub-contractor	Murray and Roberts Precast
Structural engineers	Henry Fagan and Partners, in association with Jakoet & Associates	**Piling sub-contractor**	Frankipile
		Structural steel sub-contractor	
Civil engineers	Jakoet & Associates	**- for roof structure**	Faure Engineering
Electrical engineers	Gibb Africa, in association with G Johardien & Associates	**- for light masts**	S Mazor Engineering
		- for facade trusses	S Mazor Engineering
Mechanical engineers	Gibb Africa	**- for balustrades & stairs**	J&B Steel
Quantity surveyors	Bham Tayob Khan	**Membrane sub-contractor**	Flexible Structures

Lifting the spirit

The Kwazulu Natal Society of Arts Gallery opened earlier this year, providing a public facility where the artistic spirituality of the South African nation can be expressed within a contemporary enclosure. The gallery is a competition winning building by the London and Durban-based practice of Walters and Cohen. For decades the work of artists throughout South Africa have been isolated from both the local and international community. This building of international quality and style embraces art within the local community and beyond, and is a welcome addition to the infrastructure of Durban. The KNSA Gallery humbly acknowledges its architectural ancestry, while bursting into the new found freedom so evident in the new South Africa. Text: Colin Polwarth. Photography: Angela Buckland.





Opposite page *The main gallery space of the KNSA showing the mezzanine level, the clerestory window running the length of the building, and light reflected on the terracotta-coloured walls.* ***Above from top*** *Morning view of the main entrance elevation (south east); park elevation (south west); garden elevation (north east) showing the slatted iroko screens in a steel framework*

During the past decade and longer, architectural competitions in South Africa were infrequent occurrences. Private developers preferred to use trusted architects, and generally disliked the impact of time and finance on the preparation of the brief and the design resolution. The architectural community was generally unsupportive of competition, primarily due to an unwillingness to carry the costs of professional time. The Government's Department of Public Works, has a Professional Roster; seemingly a preferred process for the appointment of architects, but it is now regarded as a system beleaguered by disputes of unfair practice.

However the South African Institute of Architects have revised their constitution and competitions are no longer so scarce. During 1995 the Kwazulu Natal Society of Arts decided to hold an architectural competition for a new art gallery to replace their suburban shopping centre premises, which they had outgrown. Competition restrictions allowed only provincially registered or University of Natal qualified architects who were required as part of the brief to find resolution to Durban's subtropical climate and a relevant architectural response for the new building. The competition drew approximately 40 entries, including several from overseas.

Walters and Cohen won the competition with a sophisticated, clear design solution to the brief, which called for the following facilities; a gallery shop, catering and restaurant facilities, an office, gallery space, presentation space, washrooms, two workshop spaces for education purposes, and a tea garden.

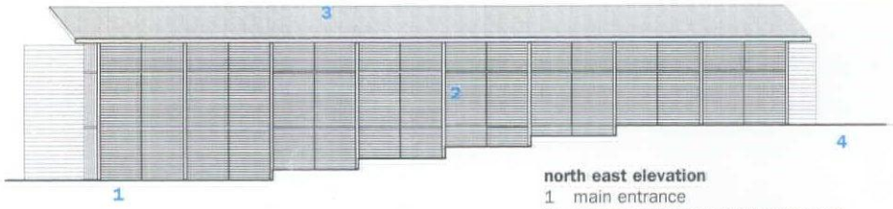
The new Kwazulu Natal Society of Arts gallery in Bulwer Road, Durban, opened fittingly by the Minister of Arts, Science and Culture, in May 1996, is a credit to the client, the judges and the professional team involved in the project. The building represents a high point in modern architectural evolution in South Africa, and is a welcome challenge to mediocrity. Local critical debates concerning architectural pastiche and stylism indicate that informed clients are questioning undistinguished architecture in a search for a relevant contemporary symbolism.

Cindy Walters acknowledges a creative inspiration from her mentor the late Dr Barrie Biermann (1924- 1991) a doyen of architectural pedagogues and writers in Southern Africa, internationally renowned for his categorisation of Cape Dutch homesteads. Dr Biermann's Durban home, and a house built for art and architecture students named "The Turkey Run" – from which the house emerged, have had a considerable impact on many local architects exposed to his inspirational teaching and architectural resolution. Biermann's focus was a lifelong search for a relevant modern reference to the vernacular.

The form of the KNSA Gallery is of two interlocking rectangles. The solid form; built of bagged hollow concrete block, contains the utility spaces. The circulation spaces and gallery are enclosed in a steel frame, wooden slatted and glazed structure, twisted in plan in response to the geometries of the roads and surrounding buildings. The juxtaposition of solid against transparent has been executed with an admirable simplicity.

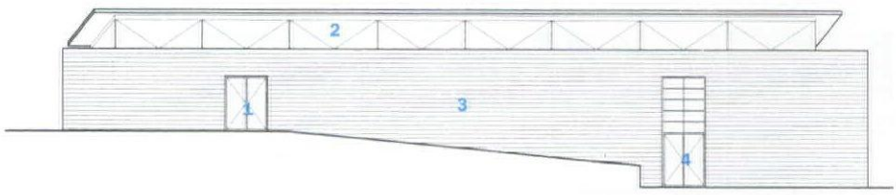
The Biermann inspired staircase, which

south east elevation (main entrance)
1 shop window
2 main entrance
3 clerestorey glazing into gallery
4 tea garden



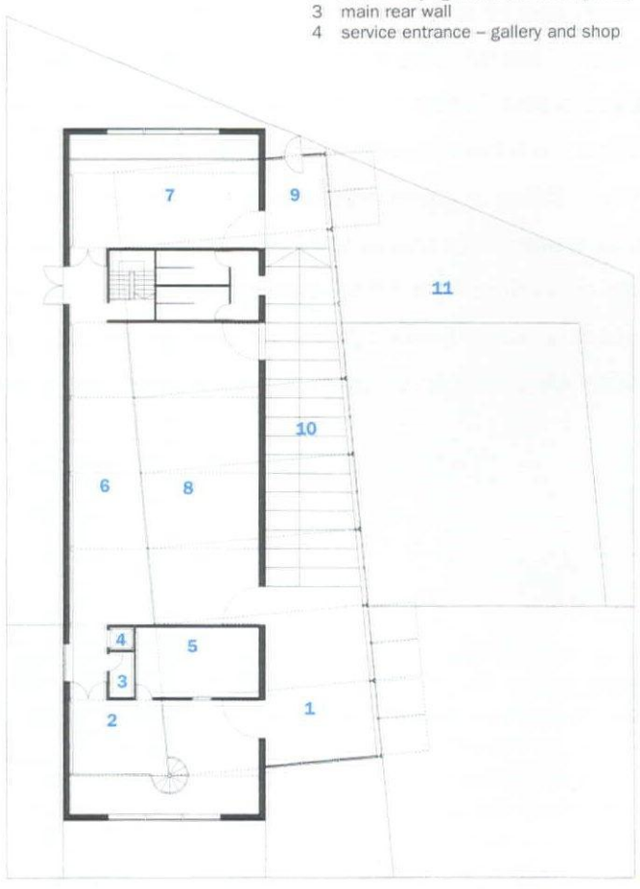
north east elevation
1 main entrance
2 timber screens to circulation zone
3 sheet metal roof
4 rear entrance

north west elevation
1 window into workshops
2 rear entrance
3 timber screens to circulation zone
4 sculpture garden



south west elevation
1 service entrance – workshops
2 clerestorey light into the main gallery
3 main rear wall
4 service entrance – gallery and shop

Ground floor plan
1 main entrance
2 gallery shop
3 kitchen
4 main gallery
5 circulation stair
6 staff wc
7 gallery store
8 wet workshop
9 main circulation zone steps
10 tea garden



First floor plan
1 double volume over entrance
2 mezzanine meeting area over shop
3 staff wc
4 disabled lift
5 office
6 gallery mezzanine
7 dry workshop
8 double volume in main gallery
9 rear entrance
10 main circulation zone steps
11 sculpture garden

descends from a secondary entrance off Bath Road, widens and is strengthened by the accentuated perspective created by the plan-form twist, providing a stepped brick finished auditorium for gallery openings. The facade of the auditorium-like space is constructed of slatted iroko screens in a steel framework. Screens at the lower and upper end of the gallery tip-up horizontally for access to the staircase and in response to the heat of Durban, allowing a free flow of air into the building at all times. The horizontal slats of this screen can be interpreted as a metaphor for the grilles of air-conditioners and car radiators. The facade acts as an aesthetic symbol for a distinctive sub-tropical denouement. Internally, the scale of the staircase volume is colossal and unapologetic, indicating a creative maturity of considerable deft from such young architects.

The shop, informal restaurant and lower entrance space all respond to the retail aspects of the gallery; positioned to attract passers-by on busy Bulwer Road. The shop front (window) with its emphasis on horizontal mullions is mindful of the tradition of a considerable number of good International Style buildings found in and around Durban. This window format is repeated at the rear of the building tying the fenestration composition together. A re-emphasis of a contemporary

Project	Kwazulu Natal Society of Arts Gallery
Client	Kwazulu Natal Society of Arts
Architects	Walters and Cohen (London and Durban)
Structural engineer	Young and Satharia
Cost consultant	Leigh, Hunt, Louis, Wanless
Lighting consultant	Berriman Associate Eng.
Contractor	Jacoby and Nichol
Landscape	Jochen Rüping

Two stairways in the KNSA. ***Above left*** *Steps into the gallery in the main circulation zone, inspired by Barrie Biermann. The accentuated perspective is created by the plan-form twist of the two interlocking rectangles – the solid form containing the utility spaces, and the circulation spaces and gallery enclosed in a steel frame, wooden slatted and glazed structure.* ***Above*** *Spiral stair leading up to the mezzanine level in the gallery shop*

trend in horizontal fenestration can be observed in the work of Sir Norman Foster, by whom Cindy Walters was employed before entering into partnership with Michál Cohen. Foster and Partners' rigour is also manifest in the delicate structure and refined detailing of the building.

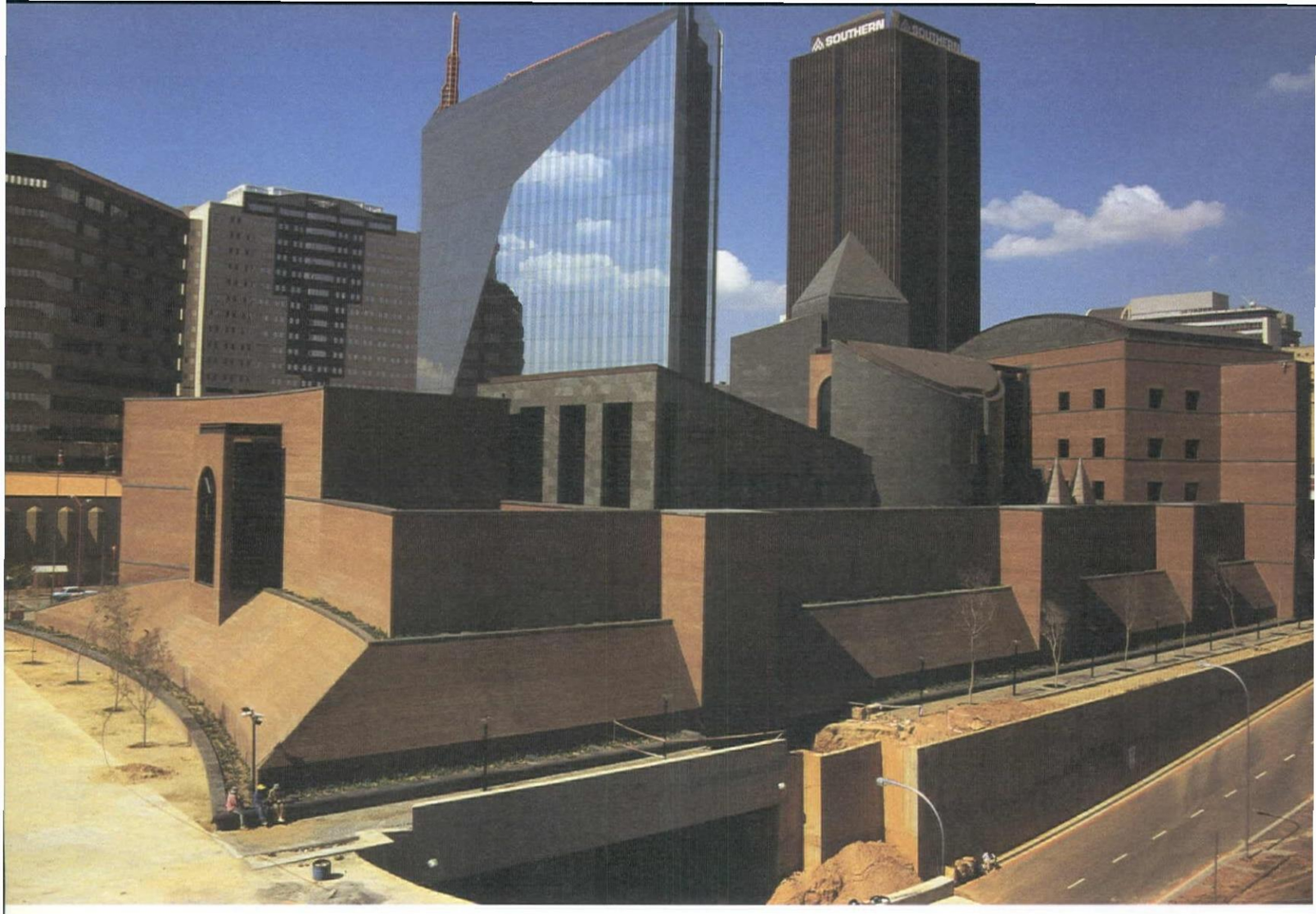
The finishes of the building are unashamedly rough as a consequence of a limited budget, and in sympathy with the vernacular building tradition. The few fastidious finishes are restricted to tactile areas, such as shop display shelving, balustrades and handles – a logical response. The fine and rough finishes are a tangible reminder of an apparent anomaly of a South African reality; that this is a First World gallery for art on a largely Third World continent. It is perhaps in the contradiction that the inspiration lies; for this is not a marble and brass faced folly, it is a simple, basic and elegant enclosure for a culturally rich community to meet and view its artists and their achievements. A beautifully refined community hall.

The circulation pattern of the building is quite evident – the spiral and dogleg steps lead up to the mezzanine lounge / conference area and mezzanine gallery respectively. The mezzanine gallery and upper workshop appear to be separated from the walls – with the use of a glazed floor strip along the floor-to-wall junction. The light grey painted steel structure of the mezzanine allows the viewer a raised platform from which to view high level artwork and sculpture from above – increasing hanging display space. The mezzanine is also connected to the main staircase via the workshop indicating the designer's wish to integrate the circulation and function of the building.

There is no attempt in the building to use symbols to represent an African style or theme. By virtue of a response to Durban – climate, rough material use, muted natural colours (pale earthy grey, cream, white and a local mud-red), scale response to surrounding flat buildings and discriminating siting of the building, the KNSA Gallery has achieved a profound architectural identity, which edges towards the timeless.

The steel "U / H" columns and beams used to support the gently sloping sheet-metal roof, the recessed guttering and water disposal system add a Miesian refinement, which being at least half a century old in formation adds a modern but poetic idiom. The building leaves an unforgettable memory in the mind of the viewer, yet there is no domination over the art it contains. Visitors to the building circulate with a familiarity that is admirable and convincing. The use of uplighters in and around the building gives the entire composition a buoyant lightness, which is especially admirable at twilight.

This is unashamedly a contemporary architect's building for artists. As a gallery it provides an uncluttered airy background for the display of art and sculpture. Function and form are evident and clear. Artists will be hard-pressed to find a more suitable and pleasant display environment in South Africa. Andrew Verster, inaugural artist of repute comments, "I have started every walkabout with 'welcome to the most beautiful building in Durban' ... exhibition sales have been astonishing ... I'm happy for the KNSA and for young artists just starting". The towering security gates, the monumental display and security wall, counterpoise against the floating lightness of the uplit ceiling and the spatial levitation caused by the multiple levels. **WA**

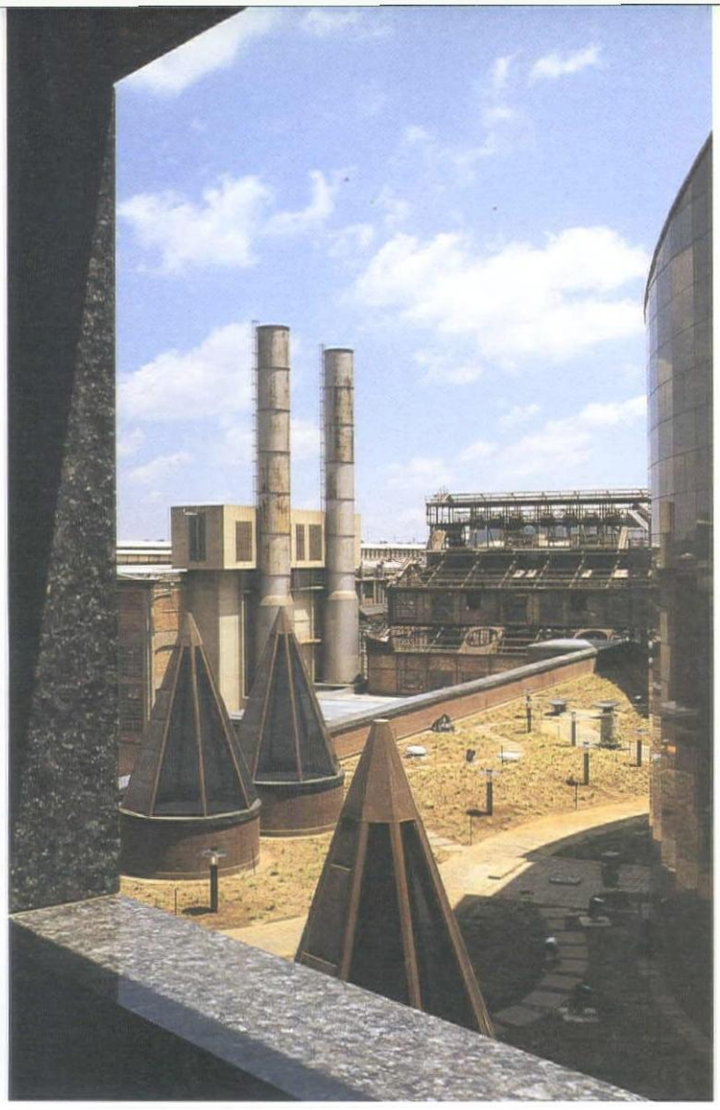


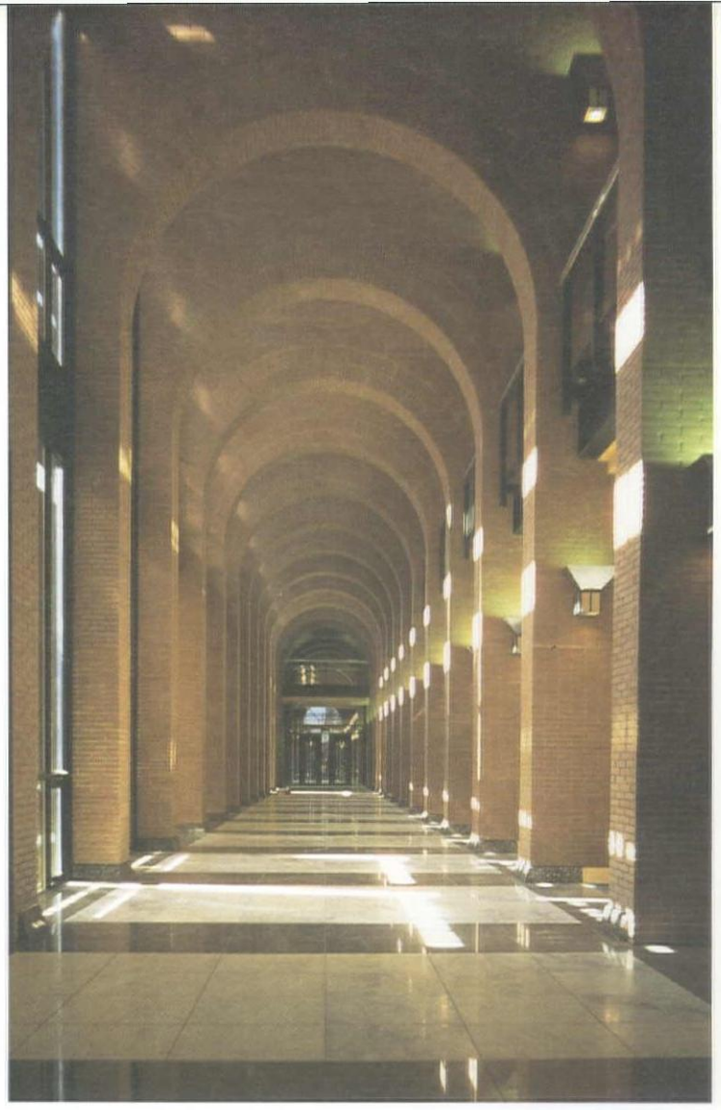
Keeping something in reserve

The newly completed Johannesburg branch office of the South African Reserve Bank by architects Meyer Pienaar, is causing quite a debate in the country's architectural circles. Though the building has been criticised for its mixed metaphors and lack of "coherent" style, most of the criticism is social, rather than aesthetic, questioning the appropriateness of its opulence and self-conscious grandeur in a society struggling with the issues of poverty and homelessness. The architects unfortunately have had to bear the brunt of these accusations as, under South African law, it is forbidden to criticise the Reserve Bank. *World Architecture* visited the bank, and putting politics aside, found an intelligent building for a serious client, but with a playful side to its character. Text: Chrisna du Plessis.

The Reserve Bank branch office serves two purposes: it is a money distribution centre for the commercial banking system and acts as front office for the money and capital market department. It also has to provide a second office for the Governor of the Reserve Bank and other Head Office executives when they might find it more convenient to conduct business in Johannesburg instead of Pretoria.

The brief called for an impenetrable fortress that reflects the Bank's prestige and image of solidarity, permanence and strength. The entire building had to be self-sufficient, with its own power supply, water storage tanks and recreation facilities, even a private shooting range, and had to conform to stringent security measures. To avoid unnecessary security risk, materials had to be low maintenance and very durable. At the same time, the building had to provide a pleasant working space, avoiding the feelings of claustrophobia often experienced in high-security buildings.





Opposite page *The brief for the new Reserve Bank branch office called for an impenetrable fortress that would also reflect the Bank's reputation for solidity, permanence and strength.* ***Above left*** *The choice of materials and details was influenced by the site's urban context; derelict industrial buildings and modern corporate headquarters.* ***Above*** *The classical Roman vaulted arch was chosen as the cohesive design element, linking the loose geometric forms,* ***below****, said to mimic African village architecture*

Formgivers

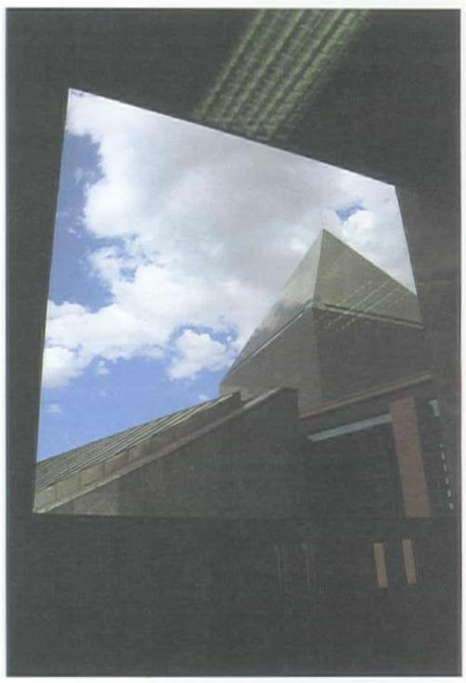
The architects rejected their client's leanings towards the black box idiom in favour of a more fragmented approach that allows dialogue with adjacent developments and is easily absorbed into the urban collage. Unfortunately their attempts at neighbourliness were thwarted by the client's insistence on a ten metre high perimeter wall surrounding the complex.

Inspired by the classic dignity of the Roman Forum, the architects chose a vaulted arcade as the cohesive element for an arrangement of loose geometric forms said to mimic African village architecture in an attempt to fuse both Western and African traditions. The composition of these elements was ordered by two strong orthogonals taken from the existing urban structure, with the main axis following the north-south street grid and a secondary axis continuing West Street's 21.5 degree clash with the site. This 21.5 degree angle was also used to inform angles such as the roof pitches and the triangular building forms.

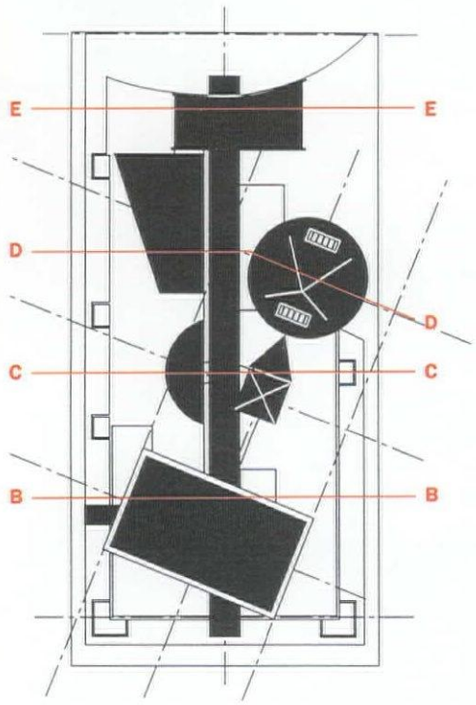
The choice of materials and details were influenced by the derelict industrial buildings located nearby, as well as adjacent high gloss corporate headquarters. Dark granite, polished steel and black aluminium were partnered with red brick, copper and blonde Canadian Maple to create an elegant yet sensual building with detailing that is very rich and absolutely exquisite in places. The bricks were specially made to the proportions of ancient Roman brickwork to further the Roman idiom.

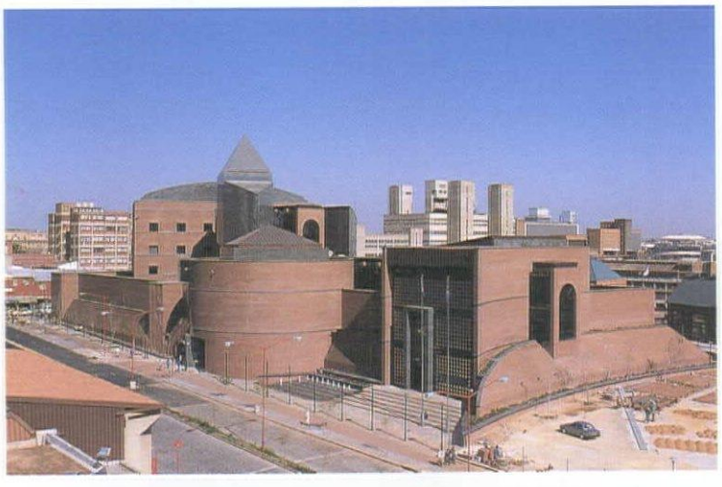
The building

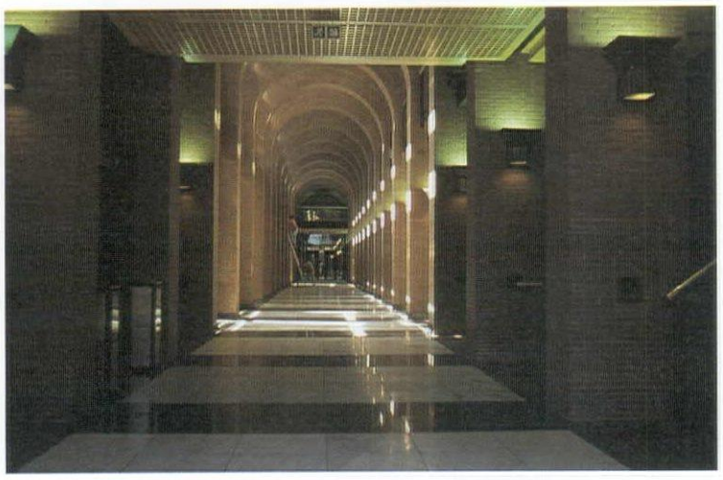
The bank consists of a buried podium topped by loose buildings clipping on to a central circulation axis. The podium contains the vast complex necessary for the receiving, sorting, storing and distribution of money, as well as the parking, mechanical plant rooms and computer control rooms.

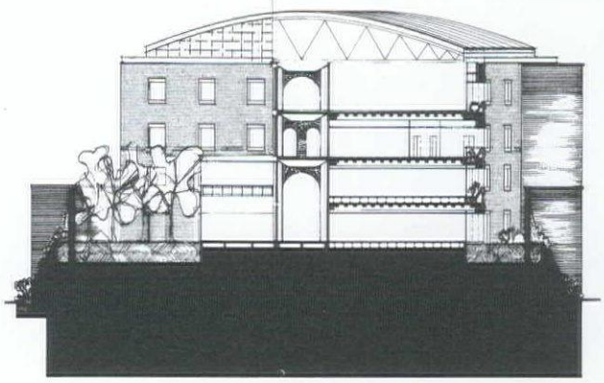


Below from top *Site plan showing auditorium (circle), head office (trapezium), staircase (triangle), lift tower (square) washrooms (semi-circle) and office tower (rectangle); The building's attempts to fuse into the existing urban landscape were restricted by the client's insistence on a ten-metre high perimter fence; Dark granite, polished steel and black aluminium were partnered with red brick, copper and blond Canadian Maple to create a building of wealth and elegance.* ***Right*** *The sections through the bank showing blacked-out areas in the basement, for security reasons*









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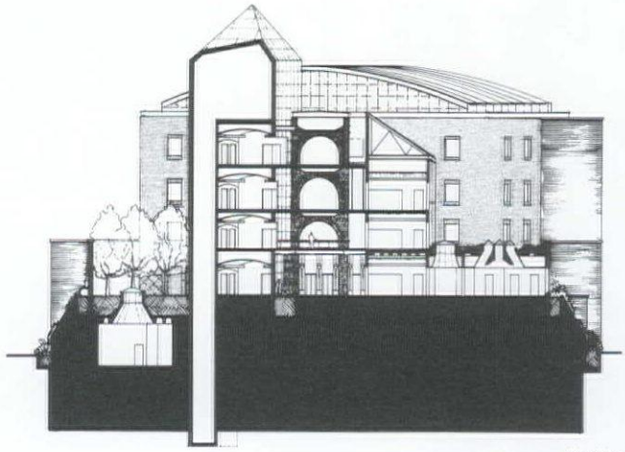

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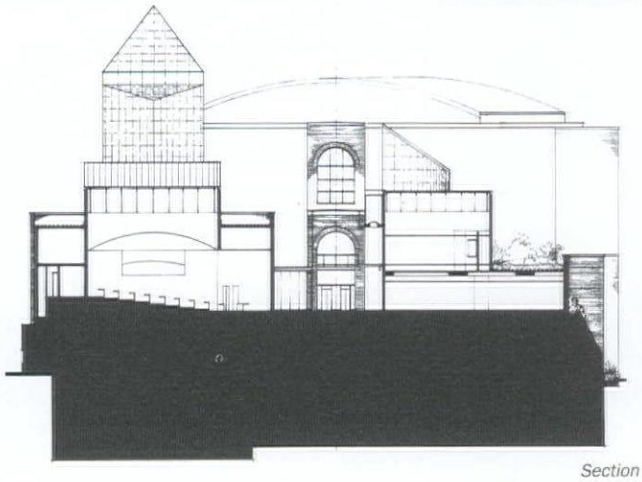

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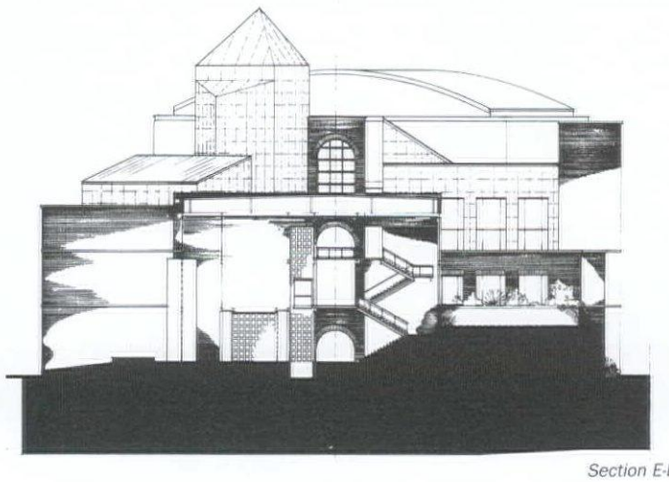

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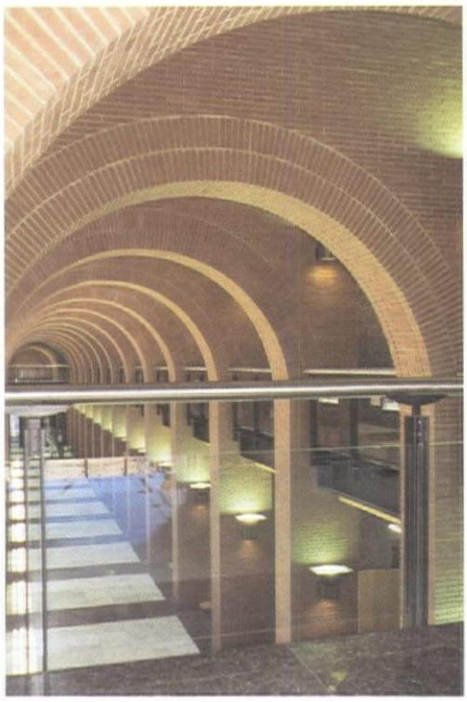
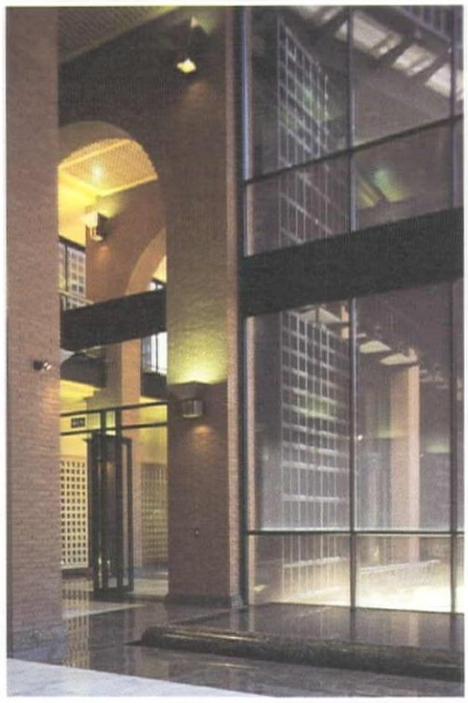
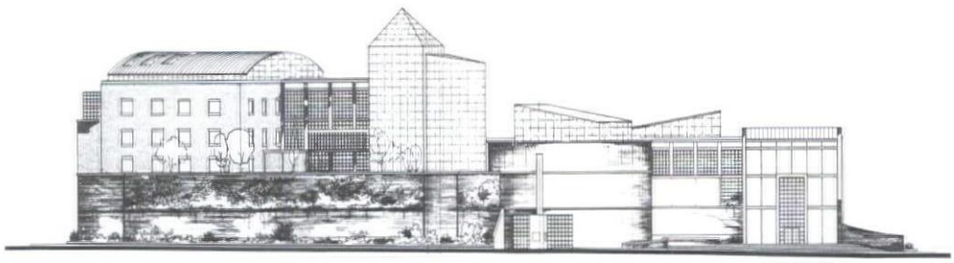
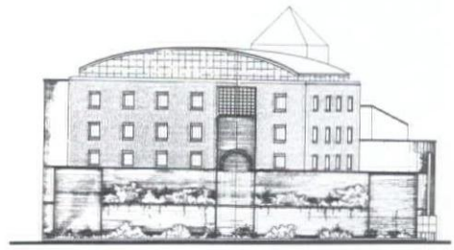




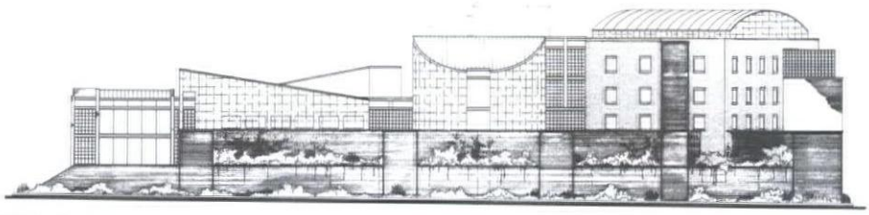
Far left *The stark geometry of the structure dictated the form of the vast, and often confusing, circulation spaces.*
Left *The architects were at pains to ensure natural lighting thoughout the building, not only to create a pleasant, unimposing working environment but also to provide a visual link with an otherwise distanced local landscape*



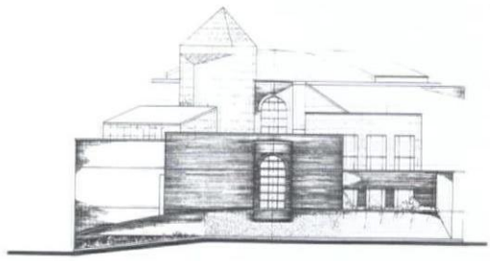
East elevation



South elevation



West elevation



North elevation

Each of the loose buildings arranged on the podium contains a specific function: a state-of-the-art auditorium (the circle), the head office facilities (trapezium), staircase (triangle), lift tower (square), washrooms (semi-circle) and office tower (rectangle). The northern end of the axis terminates in the entrance lobby, first level security point and public lift. Functions are often accommodated in unsuitable spaces to fit the stark geometry, while circulation spaces are unnecessarily vast and often confusing.

The office block contains two levels of voluminous office space that can accommodate the envisaged growth of the Bank up to the year 2050, as well as another two levels of worker's facilities, including a gymnasium, billiards room, kitchen and two separate dining rooms.

The architects took great pains to ensure natural lighting throughout the building and in general created a pleasant working environment with attractive colours and "soft" surfaces such as fabric-covered walls and blonde wood worktops.

The outside spaces between the different buildings and the perimeter wall are landscaped with low maintenance, indigenous plants. Floor-to-ceiling glazing allows workers a visual link with these pockets of wilderness, opening up the high-security enclosure.

In the final analysis the new Johannesburg Reserve Bank conforms 100 percent to its very complex and demanding brief and, as such, is a successful building. By fragmenting its vast bulk into smaller, free-standing components, the architects managed to turn a potential inner city megalith into a playful bridge between the serious financial and more exuberant cultural districts. Ironically the building ended up as a rather mischievous send-up of the client's extreme dignity and this touch of humour in a very bleak and threatening cityscape may indeed be its most commendable aspect. **WA**

Project	South African Reserve Bank, New Johannesburg Branch
Client	South African Reserve Bank
Architects	Meyer Pienaar
Structural and civil engineers	BKS Incorporated
Mechanical engineers	Spoormaker & Partners
Electrical engineers	Claassen Auret Incorporated
Quantity surveyors	Farrow Laing Ntene
Contractor	LTA Building (Gauteng)
Land surveyor	Mr Werner Kirchhoff
Piped services	Eliasov & Franklin
Subcontractors:	
- **mechanical**	Savannah Engineering
- **electrical**	Webbers Electrical
- **electronic**	Schindler Fire & Security
- **landscaping**	Outdoor Concepts

Profile

To serve, honour and to lead

The architecture of Pedro Ramírez Vázquez

A national figure and former politician, Mexico's most honoured architect is a man of many parts. His unforgettable graphics for the 1968 Olympic games presented Mexico to the world as a modern country, and his National Museum of Anthropology has been hailed as possibly the most beautiful of the great products of the Modern movement. Whilst drawing on and reinterpreting Mexico's pre-Hispanic past, his architecture eschews self-indulgence, tempering its monumentality with simplicity and a design philosophy that is the very model of humility. Timothy Ostler reports on the remarkable achievements of Pedro Ramírez Vázquez.

Mexico is a nation of monuments. From Teotihuacán, the city of pyramids, to the statues of national heroes at every street intersection, it is a country that takes its past seriously.

In the work of Pedro Ramírez Vázquez this spirit finds its architectural expression. Although not well known outside his home country, there he is a national figure – the country's most honoured and prestigious architect; a graphic and industrial designer; a professor; a former government minister and member of the International Olympic Committee. A tour of his buildings would include Mexico's houses of parliament; the National Anthropological Museum, one of the greatest museums in the world; the Azteca Stadium, scene of World Cup and Olympic football; more than 50,000 rural schools in Latin America and beyond; and, for good measure, one of the holiest shrines in the Western hemisphere. With work of this kind in his portfolio, he can afford not to be famous abroad.

Ramírez Vázquez is famous above all for his museums. Many of them are monumental, but with the scale comes a simplicity that is neutral and does not intimidate: broad masses faced with natural materials enclosing dignified, generous spaces. Nor are these buildings mere vapid formalistic exercises, as you might expect of a successful "official" architect. Some of them are strikingly original; all are sensitive to user needs. The National Anthropological Museum is mentioned in at least one history of the twentieth century (Eric Hobsbawm's), where it is described as "perhaps the most beautiful of the great products of the Modern movement".

Perhaps Ramírez Vázquez's relative obscurity has something to do with the fact that despite the scale and monumentality of so

▼ Hector Velasco Facio

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Formed 1944

Sole Principal Pedro Ramírez Vázquez

Born Mexico City, Mexico, April 16, 1919

Educated at National School of Architecture, National Autonomous University of Mexico, 1943.

Exhibitions: World's Fair, Brussels, 1958. *Pedro Ramírez Vázquez, a Mexican Architect*, Grand Palais, Paris, 1982. School of Architecture, National University of Mexico, 1985.

Selected honours and awards: Grand Prize and Gold Medal, Bienal, Saõ Paulo, 1965. Gold Medal, Mexico City, 1969. Jean Tschumi Prize, International Union of Architects, 1969. Special Award, Industrial Designers Society of America, 1969. Gold Medal, Académie d'Architecture, Paris, 1978. Member, Society of Mexican Architects, 1953 and National Federation of Architects in Mexico, 1953. Founder Member, Academy of Arts of Mexico, 1968 and International Academy of Architecture, 1985. Honorary Member, American Institute of Architects, 1953 and Industrial Designers Society of America, 1970. Member, Royal Society of Arts, London, 1972. Emeritus Architect, National Academy of Architecture, Mexico, 1983. Best Museum Annual Award to the International Olympic Committee Museum, 1995. National Award of Architecture given by the Mexican Government, 1995. Olympiart Award, International Olympic Committee, 1996. Appointed architect of America in Brasilia, 1996.

Major clients/projects: Mexican Ministry of Education, 1944-64; National Museum of Anthropology, 1963-64; Ministry of External Relations, 1965-68; Japanese Embassy, 1975-76; Basilica of Guadalupe, 1974-76; Compania Mexicana de Aviacion, 1979-84; Omega, 1984-85; Mexican Republic, 1978-80; International Olympic Committee, 1985-86, 1988; Templo Mayor Museum, 1987; UNESCO.

Areas of Specialisation: Museums and exhibition buildings, schools, offices, headquarters buildings, churches, hotels, urban planning, industrial design, graphic design.

Water pours down around the central support of the "umbrella" roof which shelters the central patio of the Museum of Anthropology in Mexico City

many of his buildings, his stated design philosophy is a model of humility. "Architecture is a discipline of service," he says, "in which you have to start by considering the person who's going to use the architecture; what his life requires of the space; how he aspires to live in that space; and what resources he has to enable him to do so... all of that has to be respected in the place where the architecture is located. The formal result I consider to be a consequence, not a starting point."

In other words, architecture is not an opportunity for self-expression but merely what you get when meeting client and user needs on a given site – no room for bombast there.

The monumentality, where present, occurs as a side-effect of Ramírez Vázquez's homage to pre-Hispanic architecture. Probably no other architect in Mexico has drawn so productively on this source: somehow he has managed to create a sense of continuity between these pre-Hispanic traditions and Modernism. The effect is somewhere between Kahn and Le Corbusier.

As a nation, Mexico's relationship with its past is complex. Although, as in the USA, European immigration was associated with massive loss of life in the indigenous population and both the Spanish language and Catholicism swept all before them, Mexico's population has remained predominantly Indian. Pride in Mexico's pre-Hispanic culture has been officially encouraged, particularly since the Revolution of 1910.

Inspiration from pre-Hispanic architecture comes mainly from the Mayan culture of the Yucatán peninsula, and the various Indian cultures in the Mexico City valley. Superficially the most striking feature of both is their fondness for monumental truncated pyramids and steep central staircases, down which – in the case of the Aztecs – sacrificial victims' bodies were thrown. Although Ramírez Vázquez makes generous use of dignified wide sweeping staircases, the rectangular pyramid is one thing that does not appear in his work.

But is Aztec monumentality an appropriate model for a modern industrial state? This is

Above *The Azteca Stadium, built 1963-1966, was used for the 1968 Olympics and remodelled for the 1986 football World Cup. Ramírez Vázquez developed a system of phased construction that ensured that the Stadium paid for itself from the very beginning*

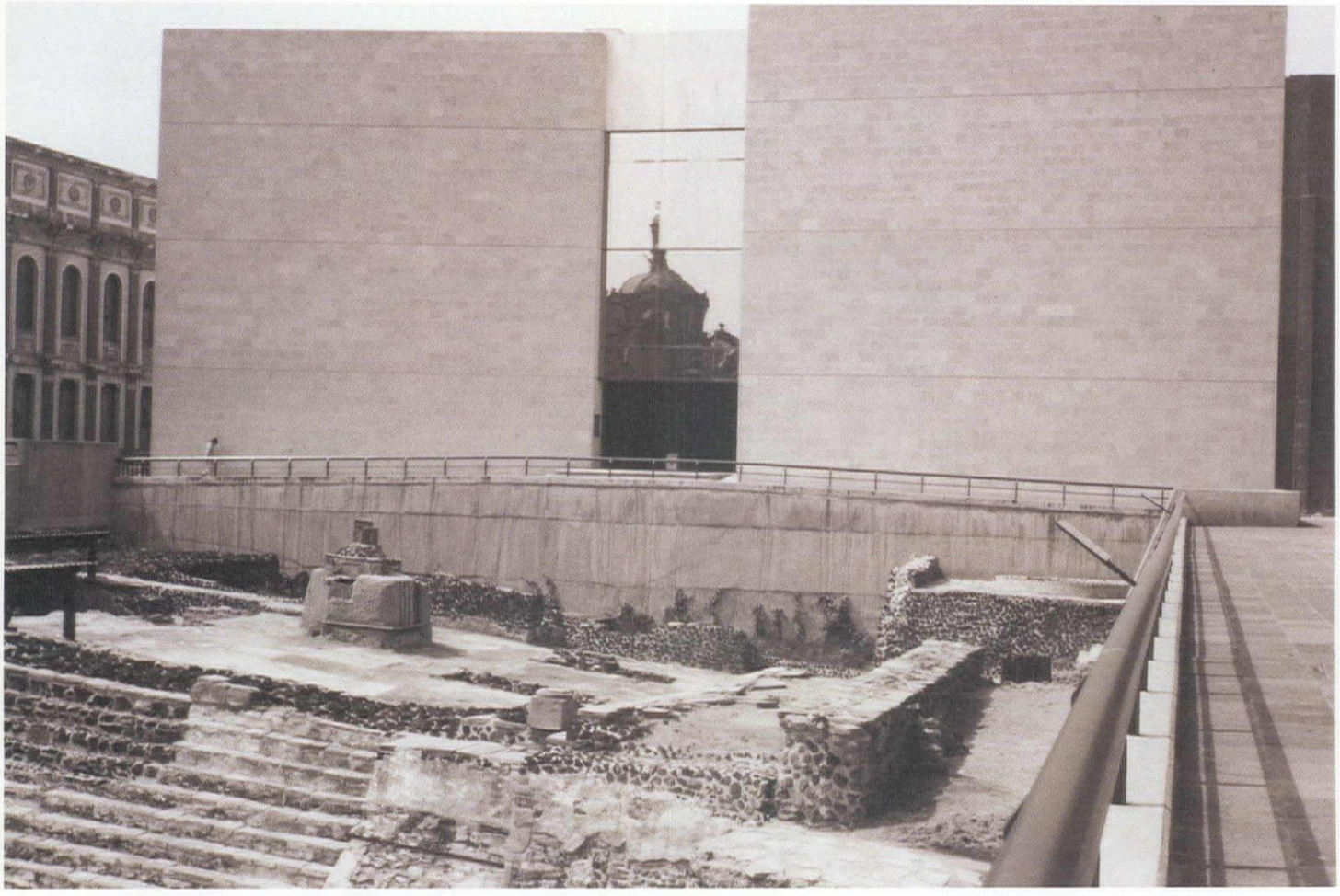
not a question that troubles Ramírez Vázquez. "No. The mentality lies in the quality of space: the great spaces, the open, ample, big spaces. What dominates in the pre-Hispanic is the collective space, not the individual space."

This quality of space is amply demonstrated in the ancient city of Teotihuacán, where the dignity and subtlety of the Square of the Moon still wields power over its occupants, fostering social interaction between souvenir hawkers, a full 2,000 years after it was built. The plan of Ramírez Vázquez's National Museum of Anthropology shows marked similarities to the ancient ensemble of the "Cuadrángulo de las Monjas" in the Mayan city of Uxmal.

The character of Mayan architecture, while retaining the pyramid form, is quite different from that of central Mexico. Its most profound innovation was that of prefabrication: the decorated stone blocks were carved before placement, inspiring the "textile blocks" Frank Lloyd Wright used for a series of Californian houses. According to Ramírez Vázquez this was the earliest example of prefabrication in history.

"Architecture is a discipline of service in which you start by considering the person who's going to use the architecture"

Ramírez Vázquez responds directly to Mayan prefabrication with the busy three-dimensional geometrical screen walls that frequently appear in his larger work. The Mayas' and Aztecs' controlled and powerful use of decoration finds echoes too in Ramírez Vázquez's regular collaboration with artists. "The relationship with artistic groups has always been very intensive," he observes. "From 1795 to 1954 the School of Architecture and the School of Plastic Arts were in the same building. So the students there worked



together, they co-existed. I was a student in the architecture school and Diego Rivera was a professor on the lower floor."

In fact Aztec friezes have a style and quality of rhythm that is arguably closer to modern print graphics than "fine art": this puts into perspective not only Ramírez Vázquez's involvement in graphic design, but also the graphic quality that appears in his architecture – for instance in the stylised classical columns at the Olympic Museum.

Ramírez Vázquez's beginning as an architect was the classic result of inspiration from a gifted teacher. His family were generally lawyers; his father ran a second-hand bookshop (the young Pedro made good use of his stock to further his education). That was the world in which he might have remained, had it not been for his history teacher.

"I had a wonderful teacher of general history," he says, "a great Mexican poet: Carlos Pellicer. In the last class of my course he told such a lively story of life in the Athenian acropolis that I understood architecture as the spaces that are lived in, not only as built elements. He'd opened up a panorama to me, and that's why I became an architect."

Two events contributed disproportionately to the shape of Ramírez Vázquez's professional career. The first of these came not long after qualification, when he got a job with the Ministry of Public Education as an inspector of school buildings. This involved travelling to all parts of the country, in the process familiarising himself with educational conditions in the countryside.

"In general American architects design with catalogues ...they become assemblers of industrial products."

Founding his practice in 1944, his first formal job was to build a series of schools in the state of Tabasco, in Mexico's tropical south. Fourteen years later and well into his career he returned to the Ministry, this time as a departmental director. He built on the local knowledge he had acquired earlier, beginning the programme that was to result in over 50,000 schools, primarily in Mexico and Latin America.

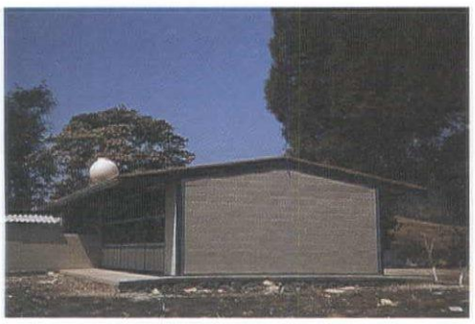
"I knew the difficulty in all the regions, the facilities that the peasants had, and the interest that they had in making their own schools," he explains. "So I thought that they could be given what they did not have, which was the structure. That was made industrially, and the schools could be finished with local materials in the walls and the sinks and the covering. And thus they were integrated into each place."

The success of the system was such that it was not only applied across Mexico, but also adopted by UNESCO in a programme for third world countries as a whole. Most of the countries of Latin America have built between 500 and 1,000 of them.

With this programme Ramírez Vázquez not only gained a reputation but also crystallised an interest in education: "It guided me towards all subjects related to education – all sorts of school buildings, museums, libraries and even the chance of founding a university."

The second key event was success in the competition to design Mexico's Azteca Football Stadium, against competition from Enrique de la Mora and Felix Candela. His master stroke was the fact that he not only designed the Stadium but also designed a sequence of phased construction that ensured the Stadium would pay for itself right from the start.

Ramírez Vázquez could hardly have guessed how far that job would take him. When Mexico was awarded the 1968 Olympiad he was at first



Opposite page *The Templo Mayor Museum, Mexico City, built when Ramírez Vázquez was the member of the Mexican government responsible for Human Settlements and Public Works.* ***Above*** *Frame system for schools: the steel frames are prefabricated and then filled in using local materials. To date, some 50,000 have been built.* ***Right*** *The Shrine of Our Lady of Guadalupe built to accommodate 12 million visitors every year*

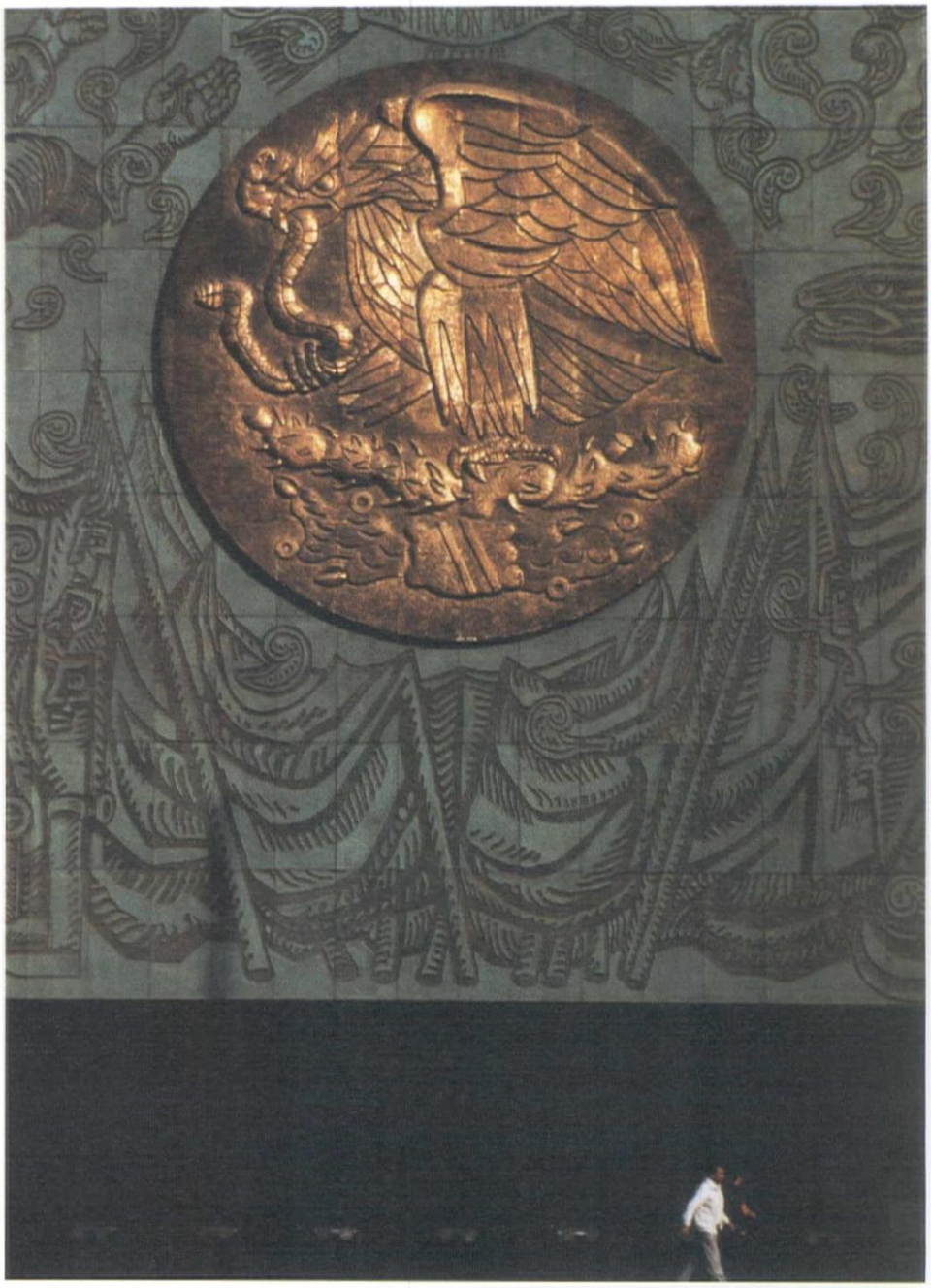
asked to build a number of venues, but then the President of the organising committee, former President López Mateos, became very ill. Ramírez Vázquez was asked to take over. He must have had mixed feelings as he would no longer be able to design all of the stadia.

"To me it was an experience of live town planning," he explains . "I had to make a city function for a common commitment that would last only a month. It was the location of all the venues, the transportation system, the atmosphere, the design and the organisation."

At the time Mexico was undergoing a period of rapid industrialisation, and the Olympics had a very specific national purpose. "My main purpose was to make the world know Mexico as a modern country" says Ramírez Vázquez. Thanks to his consistent and memorable graphic identity, that purpose seems to have been achieved.

In the Mexican political context it was perhaps inevitable that Ramírez Vázquez's prominent public achievements would lead to an invitation to join the government. In 1975 he was appointed Secretary of Press and Propaganda to the ruling Institutional Revolutionary Party. "The design of the Olympic publicity had a great impact In Mexico and everywhere else," he explains. "And for the political campaign I used the same design team that I had for the Olympic Games."

Government buildings have played an important part in Ramírez Vázquez's career. ***Opposite page*** *The Ministry of External Relations, Mexico City.* ***Right*** *The main entrance to the Congress of the Union building*



In the following year he became Secretary of Human Settlements and Public Works. This was the indirect result of the United Nations' 1966 conference on human settlements, following which the Mexican government enacted a law to put many of the principles established at the conference into practice.

Ramírez Vázquez's direct political role lasted some six years. His time at the Ministry of Human Settlements and Public Works coincided with a massive programme of decentralisation, and also the beginning of serious efforts to restore and conserve historic structures and town centres.

Fortuitously it was also during his period of office that the astonishing discovery was made that the Aztecs' original Great Temple of Tenochtitlán (the Aztecs' name for Mexico City) still survived and had not been completely destroyed when the cathedral was built, as previously thought. Ramírez Vázquez acted decisively, demolishing large numbers of buildings in the heart of Mexico City to reveal the temple, and himself designed a museum to contain its treasures. It is interesting to speculate whether this would have happened under any other minister.

In the UK and the USA we are accustomed to seeing lawyers, businessmen and lecturers entering politics. For some reason however, the sight of an architect occupying political office still raises eyebrows. But Ramírez Vázquez considers the six years he spent as a minister to be of trivial significance when set against 53 years in architectural practice.

In the UK and the USA, too, an impression of Ramírez Vázquez as an old-fashioned Modernist would be reinforced by the lack of proprietary products he seems to use. Large expanses of natural material meet up in the simplest possible way. This is a characteristic of the local building industry that helps to dictate Mexican architects' mode of practice.

In rural parts of Mexico in the early years of Ramírez Vázquez's practice it was necessary to do more than just design and specify: bricks had to be made and the workforce had to be taught not only the elementary principles of concrete but even how to use everyday tools. This placed a discipline upon rural architecture and a premium on the use of indigenous materials. It had an enduring influence on Ramírez Vázquez, in whose work the same natural materials and building techniques continually recur. This contrasts markedly with the situation in USA, where the "consumerisation" of the construction industry is at an advanced stage.

"In general the American architect designs with catalogues," says Ramírez Vázquez. "New materials, new systems... and they become assemblers of industrial products. The Mexican architect is more creative, because he's bound to what he has to hand and what he can do. He doesn't seek his inspiration so much in the catalogues. That's why American architecture is so standardised."

An American architect might say that the reason they work the way they do is because of the structure of the American economy, and as the Mexican economy continues to develop the same thing could happen there.

"Yes," replies Ramírez Vázquez, "but in Mexico it's really the economy of the client that worries architects. The North American solves that looking in his catalogue, seeing what the cheapest materials are. The Mexican architect solves that problem with creativity, to see the way he handles materials so that it will cost less. In two equal works the cost in Mexico would be about 30 percent less than the one in the United States."

This reply is a salutary reminder that mere economic or technical dominance has no necessary correspondence with the hard-won skills that distinguish a good architect.

It is hard to sum up the work of someone who is self-evidently so multi-faceted . But if leadership is all about sensing the best aspects of a group and harnessing them to a common purpose, it is possible to talk of Ramírez Vázquez in terms of architectural leadership. His most important contribution to Mexican architecture has been to assert the authenticity of its indigenous tradition, identifying its essential characteristics and reinterpreting them for a humanistic culture in the late twentieth century. **WA**

Hector Velasco Facio

National Museum of Anthropology

Above *The main entrance to the Museum on the Paseo de la Reforma.* ***Opposite page bottom*** *The central patio that provides access to all exhibition halls under the shelter of a giant "umbrella"*

"During that luncheon we witnessed an unforgettable happening: the placing, before our eyes, of the first metallic element of the famous 'central umbrella'. Despite our admiration and our faith in Pedro Ramírez Vázquez, in the valuable team of 54 architects and 24 engineers that he had gathered to help him, in the zeal and knowledge of the technicians, contractors, workers and Mexican artisans, we felt very sceptical about the possibilities of the success of the work we were witnessing. Again with surprise, several months later we received an invitation for September 17, 1964, to be present at the solemn inauguration of the monument. ...Yes, the miracle had occurred!" – Pierre Vago

The National Museum of Anthropology is one of the greatest museums in the world. It is located in the woods of Chapultepec, the loveliest and most visited wooded area in Mexico City

Part of the intention in choosing this site was to encourage visitors from as wide a social spectrum as possible. The Museum's main entrance is on the Paseo de la Reforma, the city's principal avenue which crosses the wood on one side. There is also a pedestrian entrance at the side which allows a covered entrance during the rainy season.

The Museum's collections extend chronologically across the whole range of Mexico's pre-Hispanic cultures, which are displayed in parallel with the indigenous cultures that still survive. Moving the collection from its old location near the National Palace coincided with a change in display policy towards a more dramatic form of presentation.

The Museum has 30,000 square metres of exhibition space, arranged in 24 permanent halls and a temporary exhibition hall of 1,500 square metres. Not only a museum, it is also a centre for education, research and conservation: the workshop, laboratory and research areas occupy 6,000 square metres. There is an auditorium for 350 people, the National Anthropology Library with 250,000 volumes; educational facilities with a cinema, drawing and modelling workshops, an open-air theatre and a games area; and a cafeteria and restaurant for 400 people.

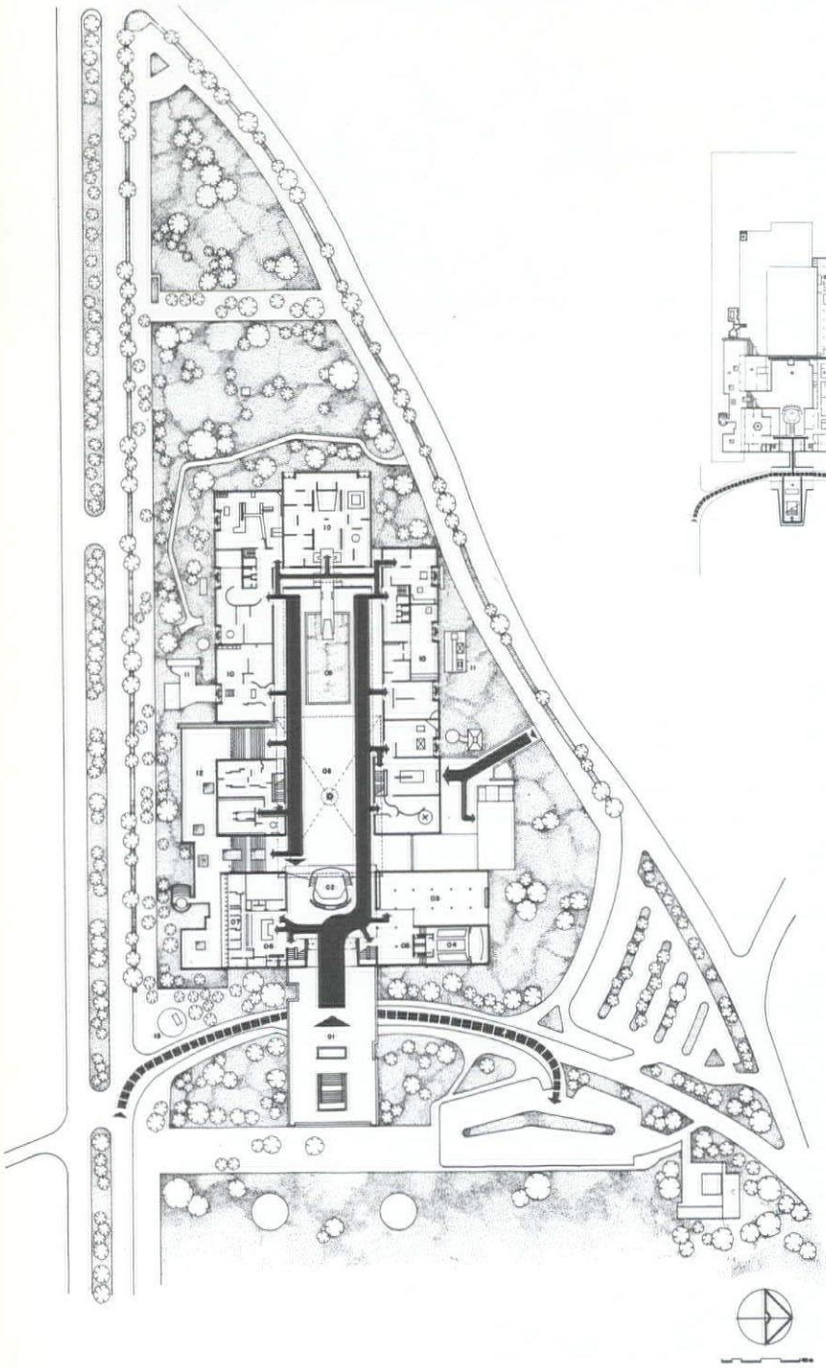
Construction began in February 1963 and took 19 months. Due to the relatively short programme for a building of this size, the structural solution is mixed: the main part of the building used a prefabricated steel structure so that it could be constructed after the umbrella roof and exhibition halls had been erected. This allowed greater freedom of movement for the machinery necessary to raise the umbrella. Completing the exhibition halls first also permitted an early start on their complex display installations.

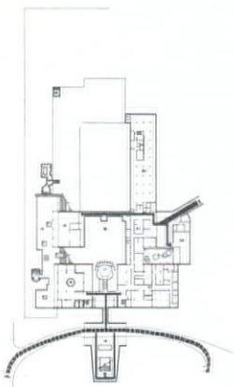
The Museum is universally acknowledged to be a major attraction in its own right. Its dominant impression is one of exceptional spatial generosity – an undeniable feature of much of Mexico's pre-Hispanic architecture. The entrance hall is double height and measures 45 metres across. Opposite the entrance is a curvilinear auditorium inspired by the circular pyramid of Cuicuilco, near the University City. The central "patio" is the scale of a large city square, and was greatly influenced by the Quadrangle of the Nuns at the Mayan site of Uxmal. It falls naturally into two contrasting areas: the one light, the other relatively dark, thanks to its enormous 54 x 82 metre protective umbrella.

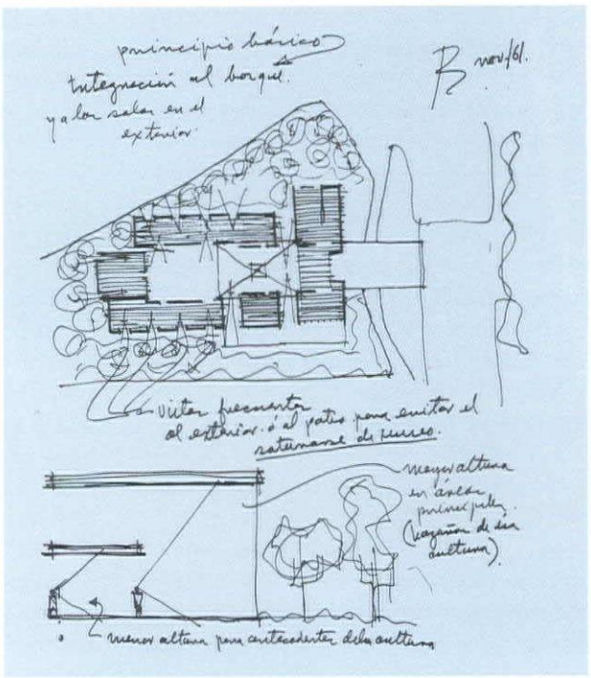
At first sight the umbrella might appear to be a spectacular but arbitrary gesture. However, it came about as the logical result of a series of rational decisions.

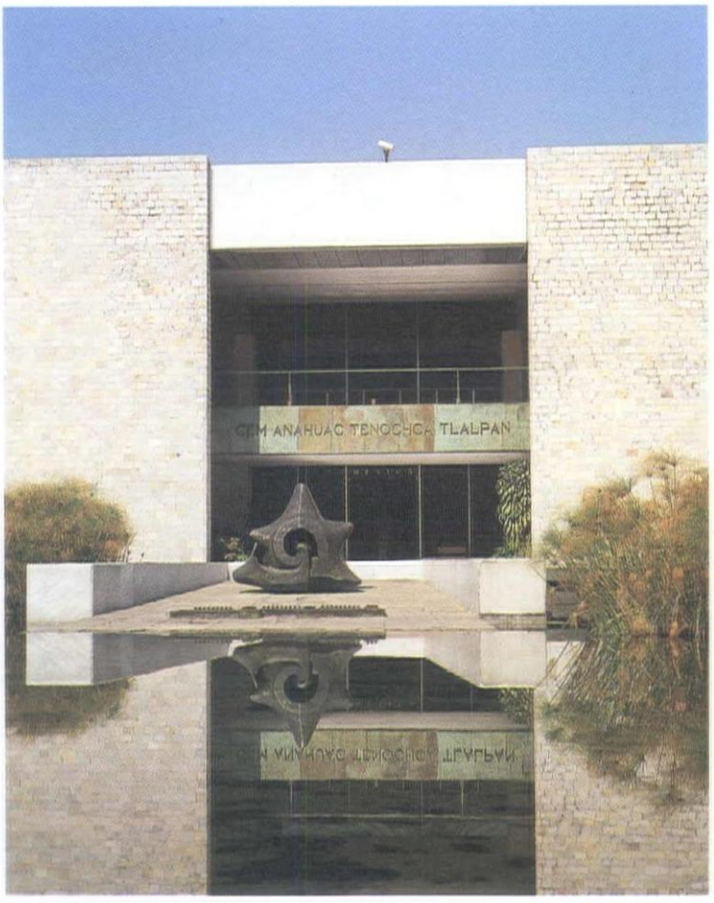
Because of the Museum's sheer size, it was sensible to make it easy for visitors to focus on one or more exhibition halls for a particular

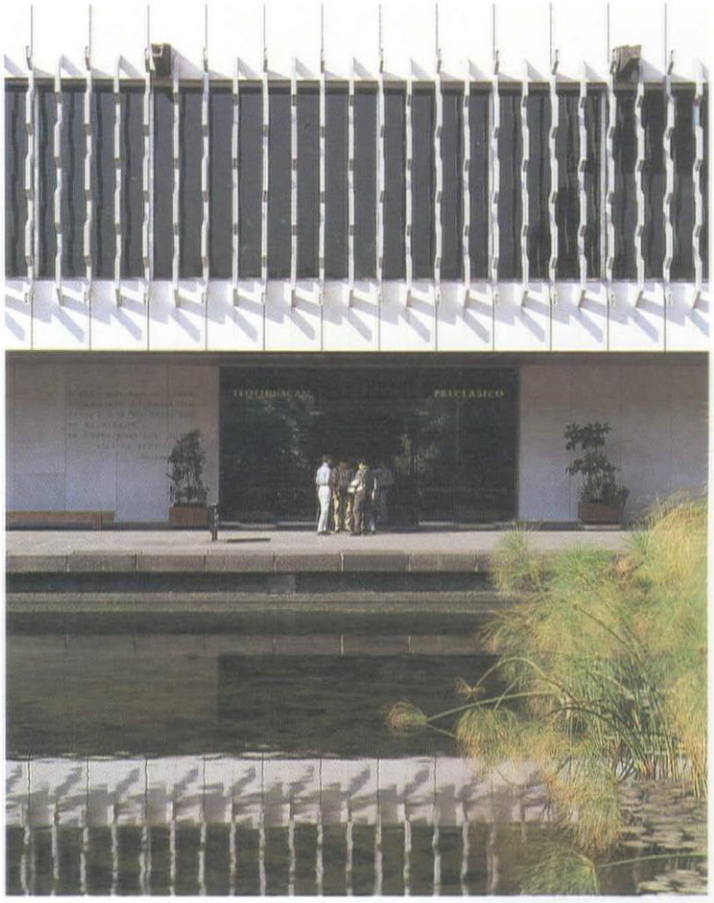
Left *Aerial view showing the plaza to the front of the building and the central patio partially sheltered by a floating roof supported by a single mast which can be seen in the centre of the photograph.* ***Below left to right*** *Ground floor plan, lower ground floor plan and first floor plan.* ***Bottom right*** *Preliminary sketches*

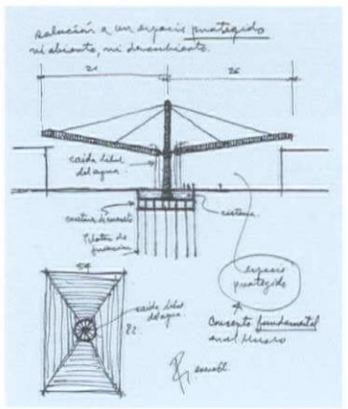


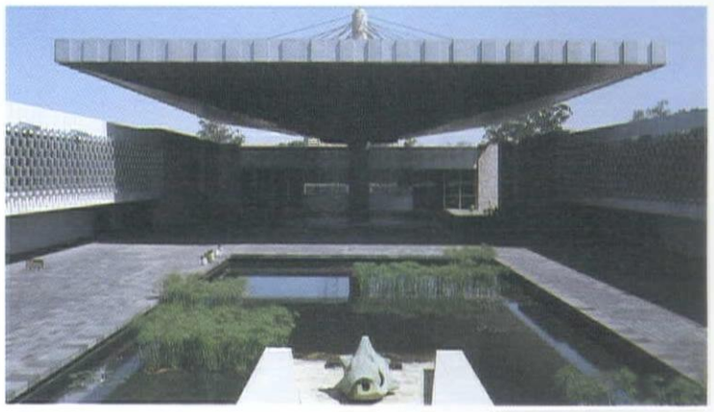












Above *Entrance to the Mexica Hall at the western end of the central patio.* ***Above right*** *Rooms on the upper floor have views of the patio through vision screens made up of complex three-dimensional modules.* ***Right*** *Preliminary sketch of the patio's umbrella-like roof showing the massive earthquake proof foundations.* ***Far right*** *The "umbrella" seen from the western, unsheltered end of the patio*

visit. So rather than imposing a path that was to be followed in strict sequence, Ramírez Vázquez provided the patio to serve as a gigantic circulation space, a kind of "plenum chamber", allowing visitors free circulation at will between the different halls. Halls are so arranged that it is not possible to visit more than two without re-emerging into the central space. But if it were completely open, free circulation would not available at all times during the rainy season. A perimeter shelter was possible, but would also have the effect of destroying the free circulation.

"In architecture you have covered space and open space," explains Ramírez Vázquez. "This is a protected space. The idea of the umbrella is that the sight of the sky is not lost, that people will not feel that they're in an enclosed space. The spectator is always looking at the sky: with this cover it needs only one support (actually it has more because of the cables)."

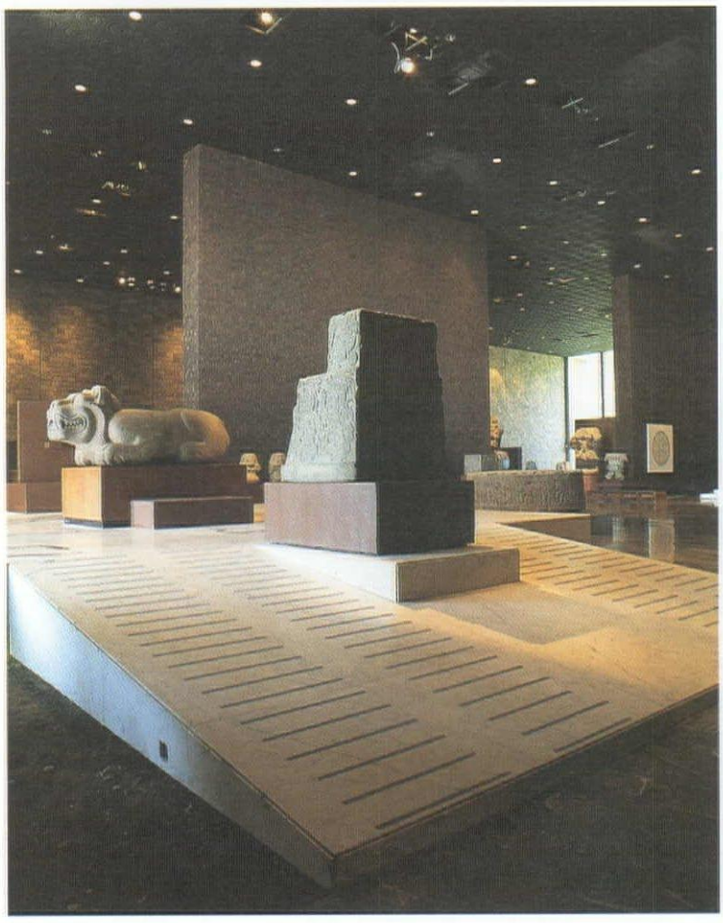
The challenge of how to drain the umbrella was a classic example of a problem being turned into an opportunity and resulting in the building's most memorable feature. "When the umbrella was built that way, we knew that it was in the middle of a wood," says Ramírez Vázquez. "It rains. If the drain is clogged up we would have a lot of water there. So to avoid it I open it up here to fall down (here he points to the roof openings at the top of the column). And if water's going to fall down, I turned it into a fountain." The fountain drains through holes punched laboriously through the basalt paving stones. The column itself is encased in a relief sculpture by the Chávez Morado brothers. Each point of the compass represents a different aspect of Mexico.

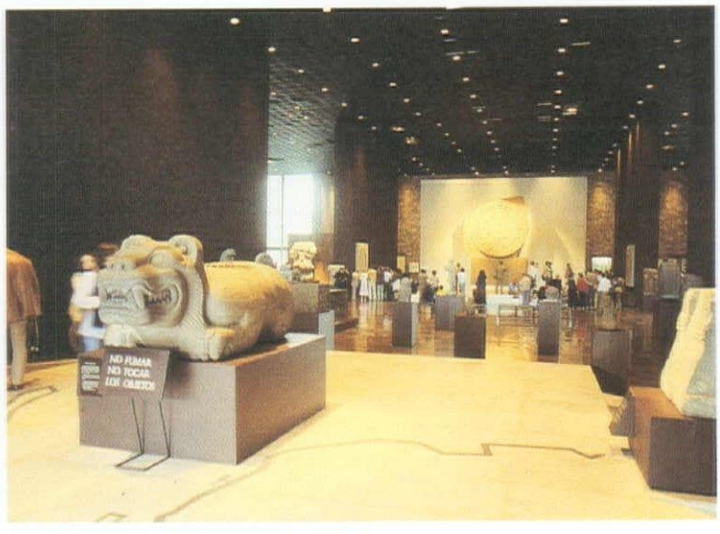
There remained the matter of the foundations. Ramírez Vázquez again: "The base of the fountain is built below to recirculate the water. Because of the construction and the earthquakes, this is a concrete box. The box has friction piles – they're like roots, they are the resistance layer. The foundation is heavier than the umbrella. It's like a tree."

Although the umbrella has a very basic functional effect in making the Museum's circulation work, spatially it also shortens the apparent length of the central space. The Mexica hall, on the axis of the space, contains displays on the classic period of Aztec civilisation. Keeping the space in front of it open to the sky and filling part of it with a pond linked to the hall has the effect of drawing attention to this, the most important part of the Museum.

The strictly orthogonal plan form is fully in keeping with the spirit of pre-Hispanic architecture – particularly Teotihuacán. Housing all of the building's disparate functions within a series of generous rectangular spaces lends the building an atmosphere of relaxed tranquillity that transfers to its visitors.

The building was designed with psychological factors very much in mind. For instance visitors emerging from the sixth hall can be




NO FUMAR
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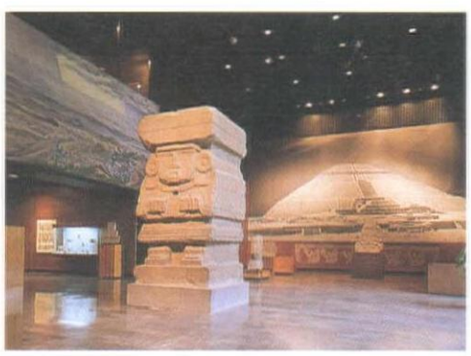
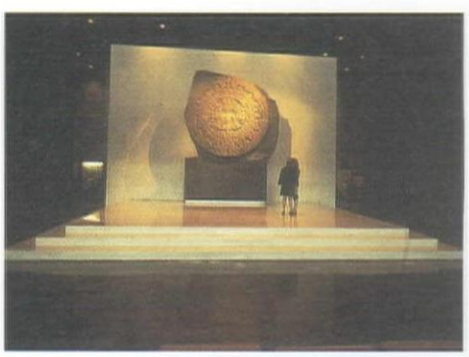
LOS OBJETOS

Above, opposite page and right *Interior views of the Museum showing how the monumental simplicity of the building complements the ruggedness of the larger exhibits*





Hector Velasco Facio

expected to be a little tired. As they look towards the Mexica Hall the Museum's most important exhibit, the Aztec Calendar, can be seen through a hole in the wall.

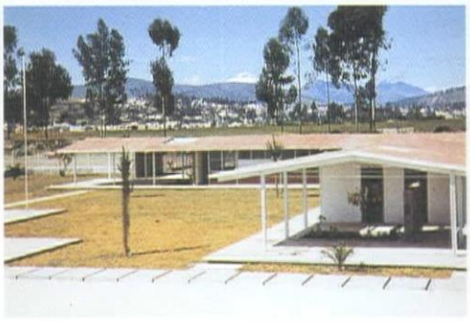
This direct visual connection across spatial barriers – whether vertically or horizontally – is a common feature of Ramírez Vázquez's work. The central patio is also designed with views to the wood beyond to ensure that visitors never feel hemmed in – this corresponds with a form of spatial enclosure common in Mayan architecture, as in the Quadrangle of the Nuns at Uxmal. Most of the halls too have views out into the wood, where in some cases the exhibition continues, by an architectural reconstruction, or the display of large archeological pieces or monumental models.

The palette of materials used is restricted: grey floors, Santo Tomás marble, white marble, aluminium and crystal. The appearance of the exterior masonry walls of the museum corresponds closely with the plain areas of Mayan architecture, as at Uxmal. Upper halls also pay reference to Mayan precedent, having a view of the central space through a vision screen made up of complex three-dimensional modules.

A series of murals throughout the building refer to its collections. For the vestibule Rufino Tamayo painted an allegorical mural on the struggle between the two principal opposing gods of pre-Hispanic mythology: the feathered serpent Quetzalcoatl and the jaguar Tezcatlipoca. **WA**

Location	Woods of Chapultepec, Mexico City (Paseo de la Reforma)
Date of inception	February 1963
Date of completion	September 1964
Co-authors	Arq Rafael Mijares Arq Jorge Campuzano
Museographic consultants	Alfonso Soto Soria, Mario Vázquez
Site architect	Arq Juan Miramontes
Civil engineers	Ing Fransisco Alonso Cue, Arq Roberto Monter Carpio
Structural engineers	Felix Colinas Oscar de Buen
Plan area	55,625 square metres

Above *The steel framework of the schools is finished in locally available materials. The schools have been built in many countries,* ***right*** *in Equador,* ***far right*** *at its simplest in Brazil.* ***Below right*** *Plans and elevations*



Rural Schools

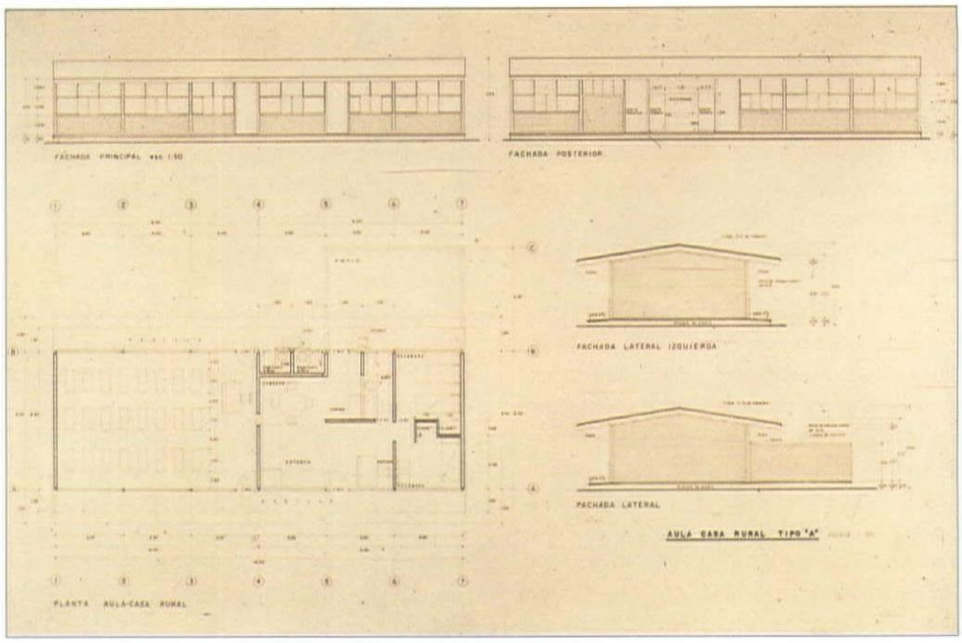
Brief: An industrialised system to allow rapid construction of rural schools.

Challenge: Country dwellers are in general well able to build walls but have more difficulty in building roofs with the necessary span for a classroom.

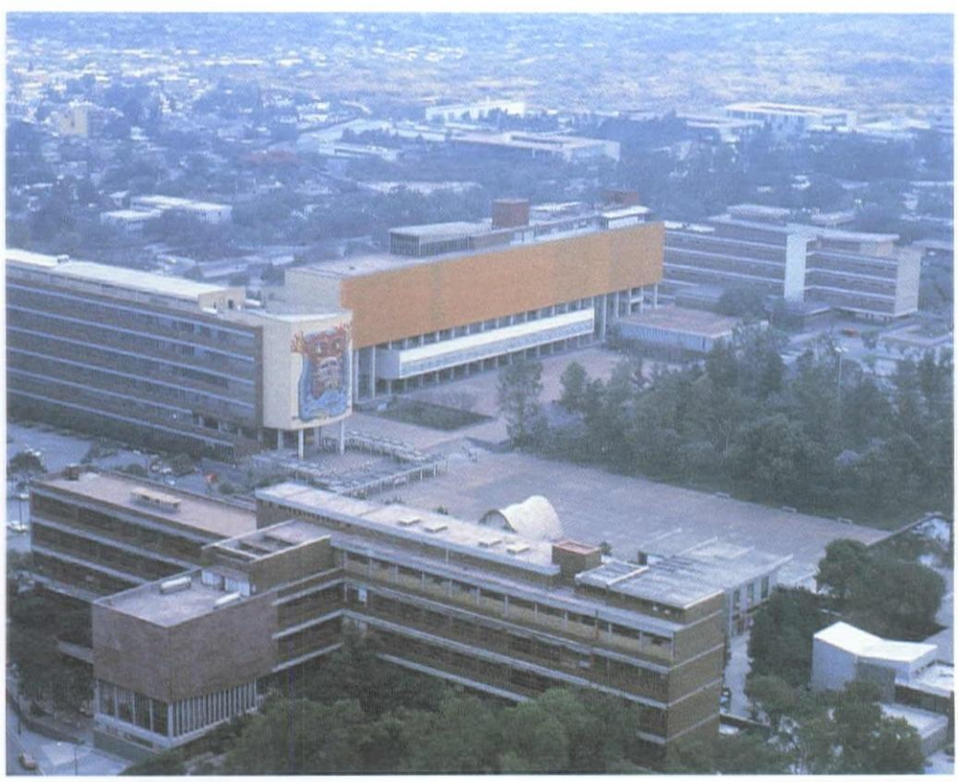
Solution: Ramírez Vázquez designed a flexible steel framework that provides a basic structure to be finished using local materials. The components of the system are small and light enough to be transported on the back of donkeys, mules or even canoes. In Mexico City the basic arrangements are enlarged by building schools with two or three levels. In rural schools they are enlarged by adding a teacher's house and called a "rural schoolhouse".

Date: Over 200,000 units built in Mexico alone between 1958 and 1996.

Other factors: Adopted by 20 Latin American countries as well as India, Indonesia, Yugoslavia, Italy and the Philippines. Awarded Grand Prize of Honour at XII Triennial of Milan in 1960.



Above *The principal facade is decorated with a mural by Francisco Eppens.* ***Below*** *Aerial view showing the overall composition of the building*



Jose Rogelio Alvarez

National School of Medicine

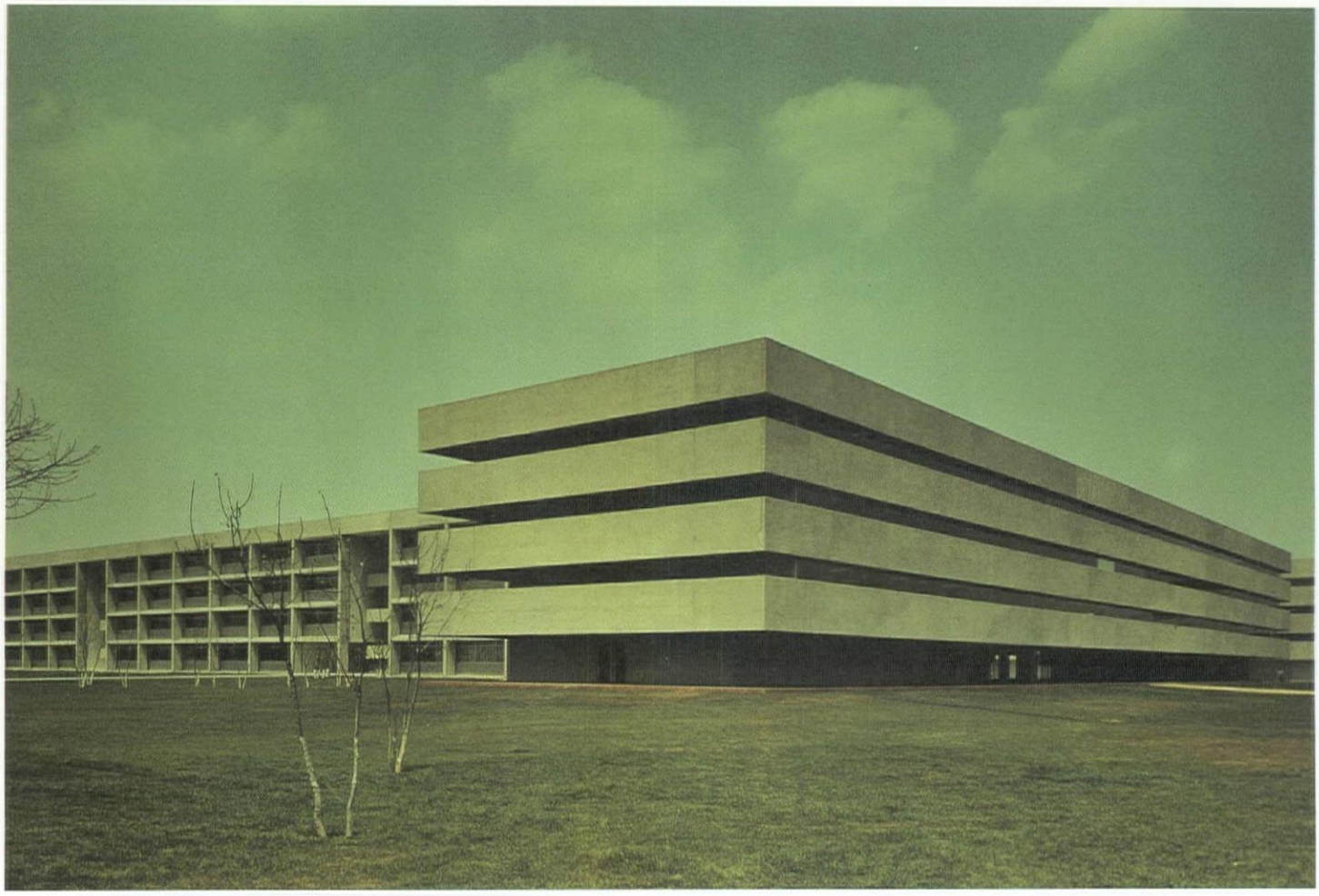
Co-authors: Roberto Alvarez Espinosa, Ramón Torres Martínez, Héctor Velázquez

Brief: Largest school of medicine in Mexico to accommodate 6,000 students, to include laboratories, administration, lecture theatre, seminar rooms, operating theatres, cafeteria and a section reserved for animals.

Challenge: The building was part of a new university city built on the Pedregal lava field to the south of Mexico City. Architects for other buildings in the university included Luis Barragán and Juan O'Gorman.

Solution: A composition of four blocks. The disposition of volume, shadow and light follows principles established by Le Corbusier. On the principal facade is a mural by Francisco Eppens depicting the cycle of life and death.

Date: 1952-1953



Francisco Uribe

Above *Exterior view.* ***Left*** *View of the interior of one of the quadrangles.* ***Below*** *Aerial view showing the ability of the building to be extended*

Autonomous Metropolitan University

Co-author: David Muñoz

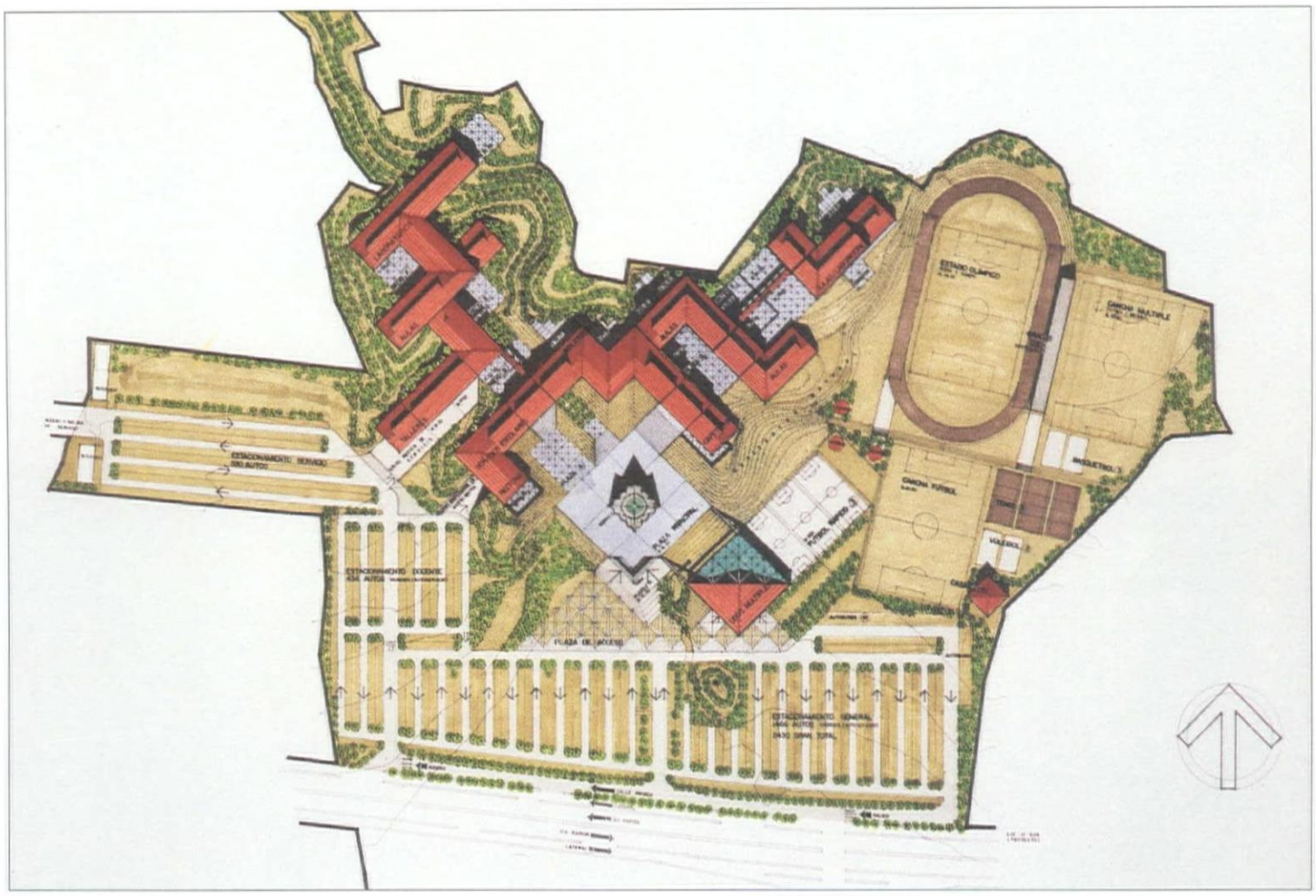
Brief: New university campuses at Xochimilco, Iztapalapa and Azcapotzalco, each to accommodate 10,000 students.

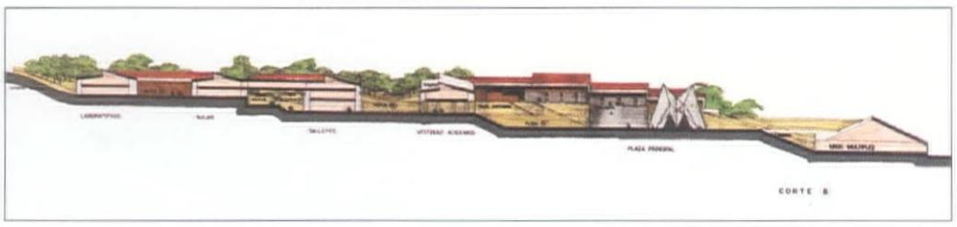
Challenge: The new universities had to accommodate growth in a controlled way and retain a human scale as they became larger. Teaching accommodation was to be integrated with student areas.

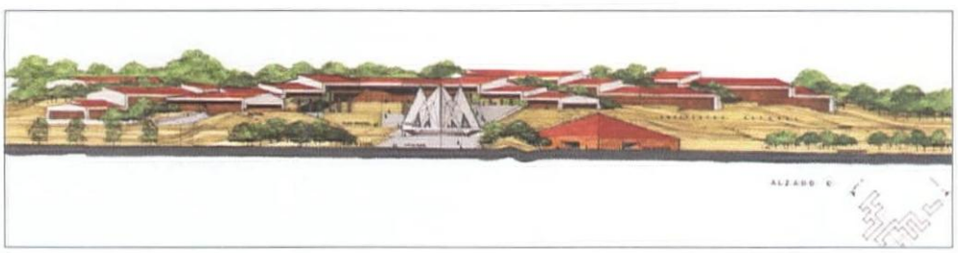
Solution: Both campuses arranged as a series of quadrangles.

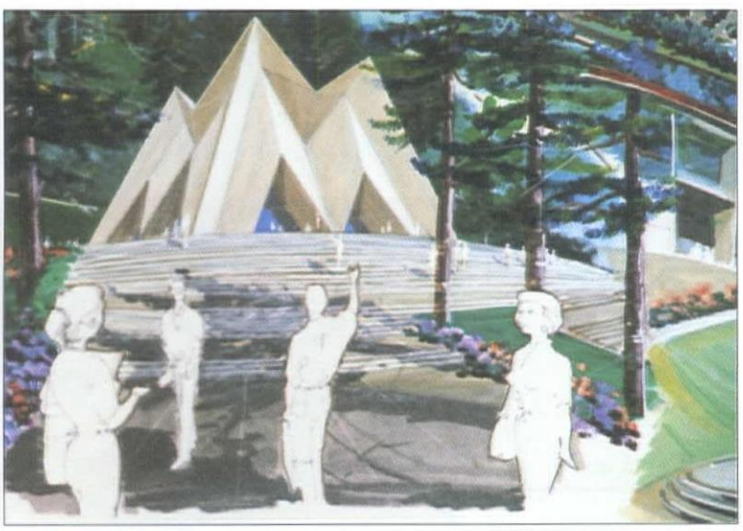
Date: 1972-1974

Other factors: Ramírez Vázquez was President of the University from 1974-1975.









Above *Overall plan.* ***Left*** *Elevation.* ***Below left*** *Detail of the symbolic structure at the entrance to the University*

Marista University

Co-authors: Andrés Giovanini García, Javier Ramírez Campuzano, Rafael Ramírez Ibañez

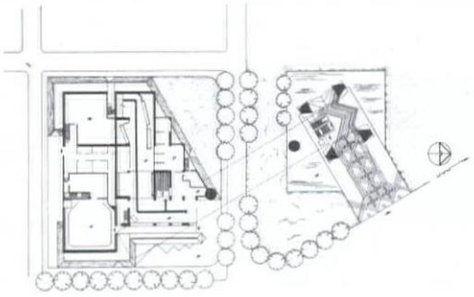
Brief: New university in the south of Mexico City.

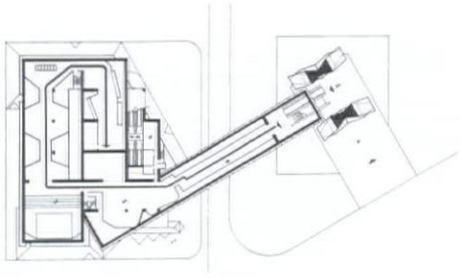
Challenge: Each teaching discipline had to have its own identity.

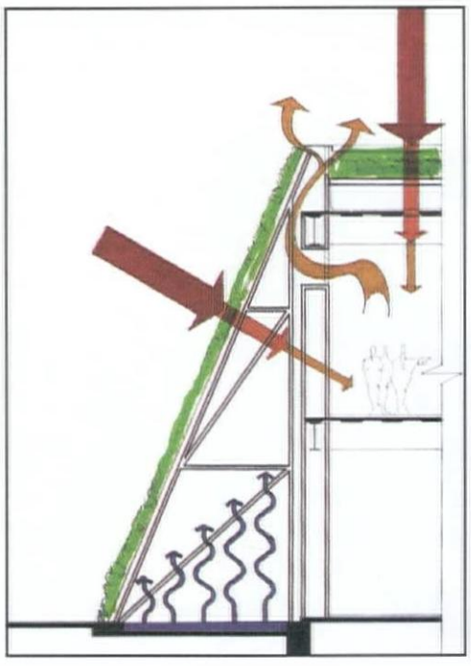
Solution: The University is conceived as a set of cloisters or patios. Faculties were differentiated by different planting, each chosen to reflect its semi-rural location.

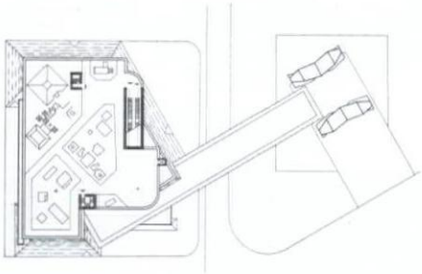
Date: Designed 1993. Currently under construction.

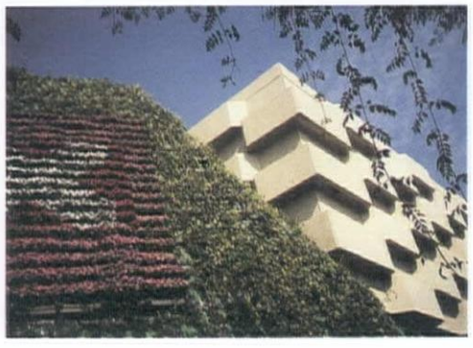
Top *The "X" motif used at the entrance to the Pavilion is typical of Mayan decoration.* ***Clockwise from right*** *Ground floor plan; first floor plan; second floor plan; vegetation is used to cool the exterior of the building; diagram of natural climate control*











Mexican Pavilion, Seville 92

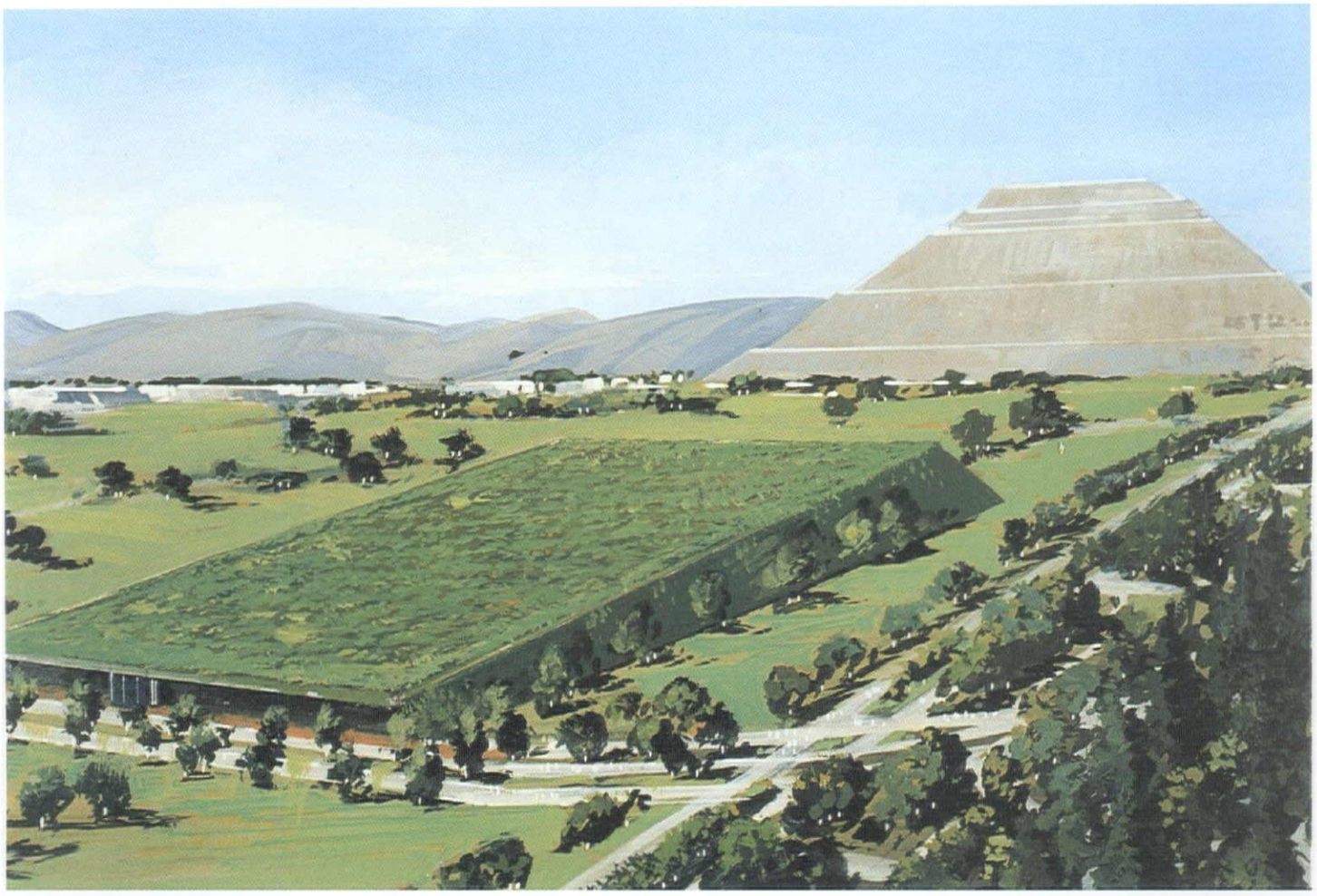
Co-authors: Andrés Giovanini García, Javier Ramírez Campuzano

Brief: Because of the 500th anniversary of the discovery of America, the design was required to reflect the meeting of two worlds.

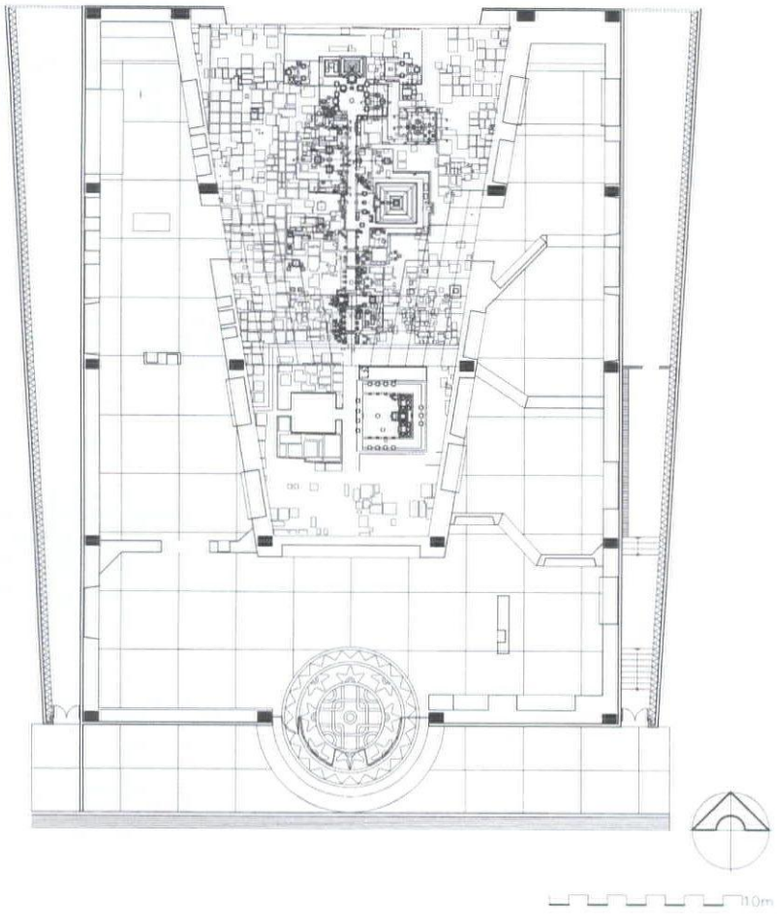
Challenge: The building had to maintain a comfortable temperature in spite of Seville's high temperatures, and yet minimise the cost of air conditioning.

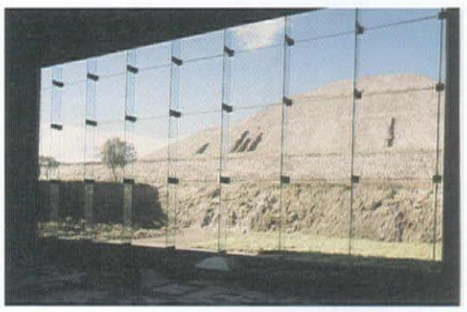
Solution: Perimeter walls and roof were covered with vegetation. The "X" is a motif extracted from Mayan prefabricated decorative units. Mexico also happens to be the only country name that contains an X.

Date: 1990-1992



Above *The Museum is half buried to minimise its impact on the site.* ***Right*** *The large north window looks toward the Temple of the Sun.* ***Below*** *Interior plan shows how the entire site is recreated in model form*





Teotihuacán Museum

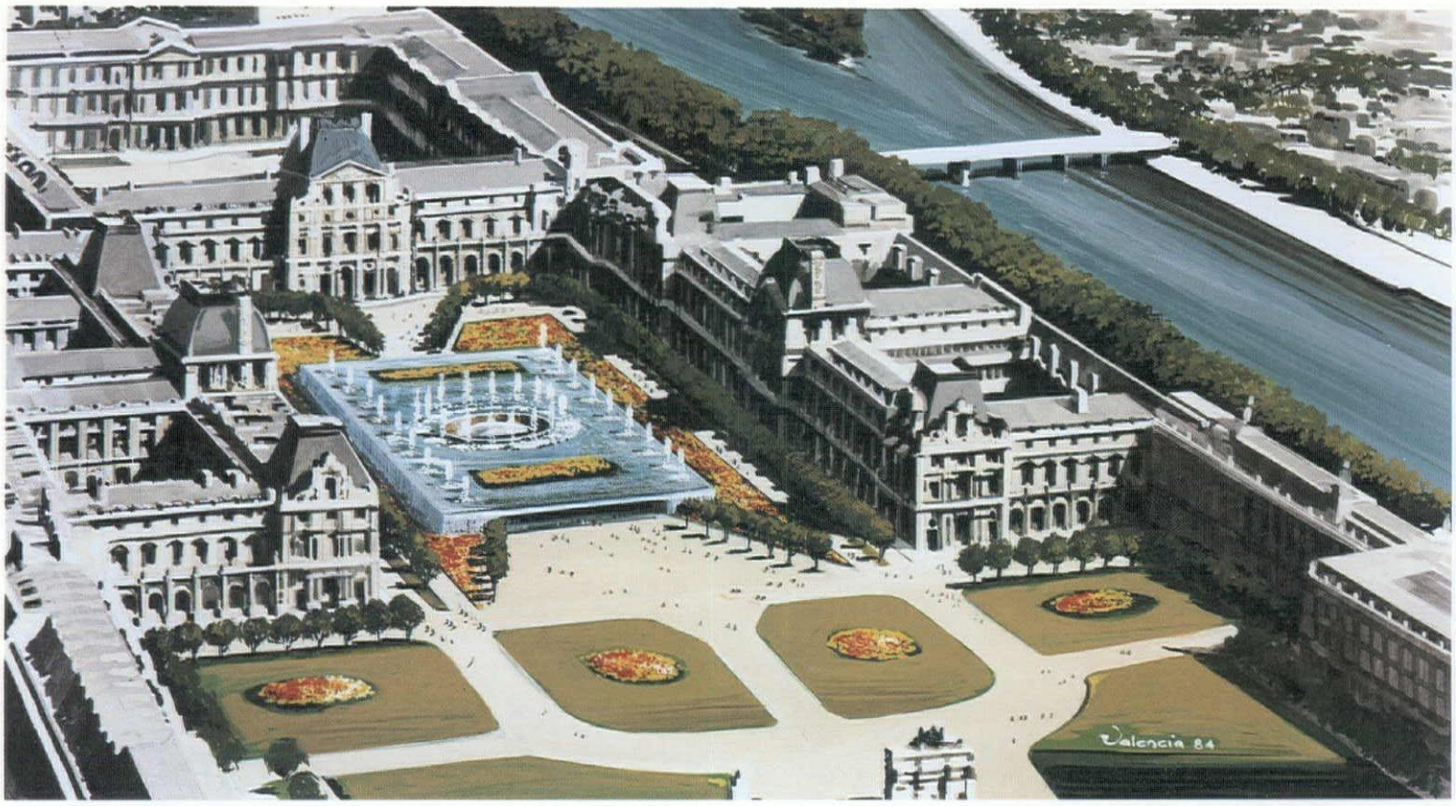
Co-authors: Javier Ramírez Campuzano, Andrés Giovanini García

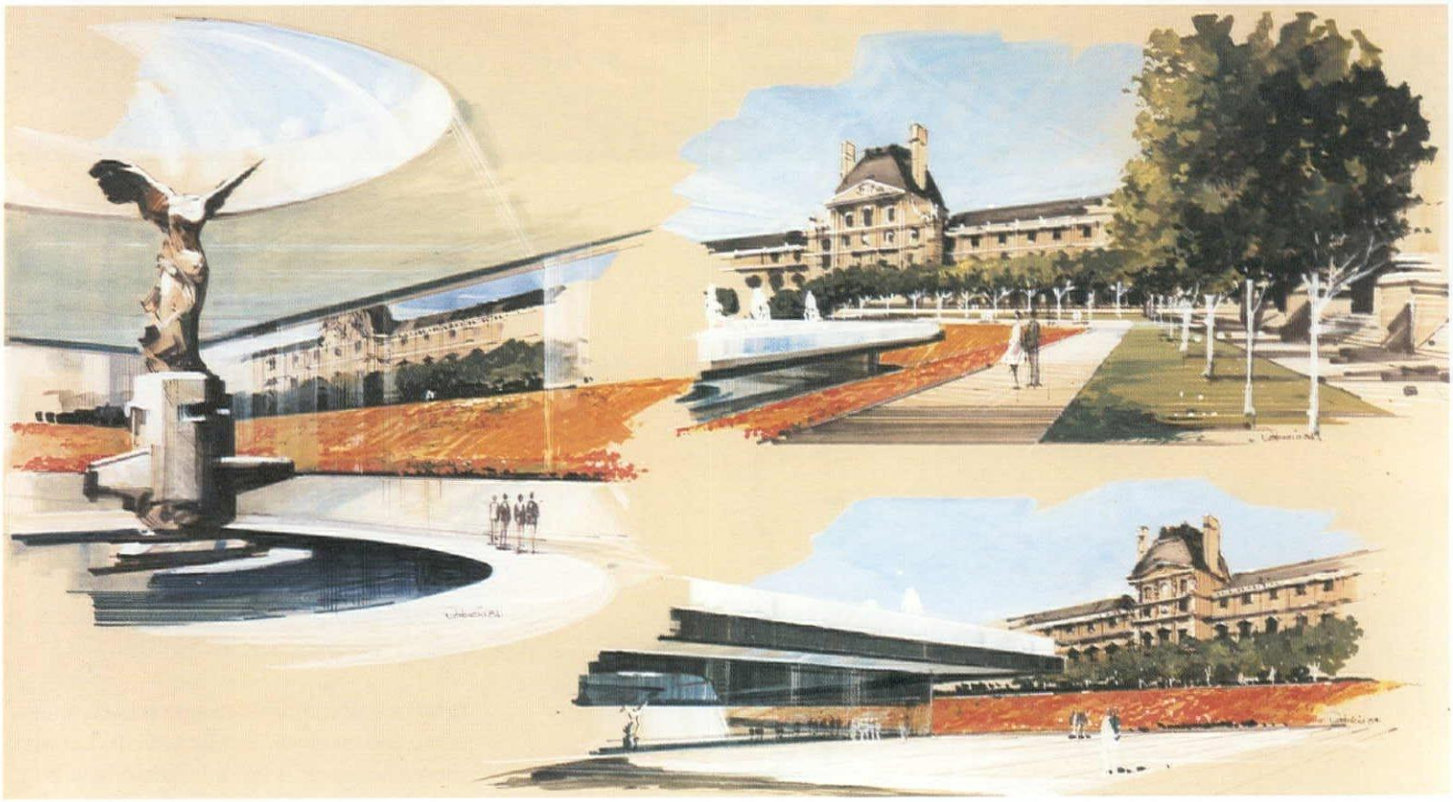
Brief: A museum situated within the grounds of the ancient city of Teotihuacán. Its site was chosen because it is the only part to have no archeological remains.

Challenge: The building had to maintain a discreet presence without isolating visitors from the ancient city around them.

Solution: The Museum was built partially underground, covered with vegetation to minimise its impact on the archeological site. The roof tapers upwards to accommodate a large window which has the effect of making the Pyramid of the Sun part of the exhibition.

Date: 1993-1994





Top and above *Aerial perspective and detail perspectives of the sunken visitor facilities and museum entrance*

Louvre competition

Co-authors: Iker Larrauri, Jorge Agostoni, Alfredo Valencia

Brief: Additional visitor facilities for and access to the Louvre Museum.

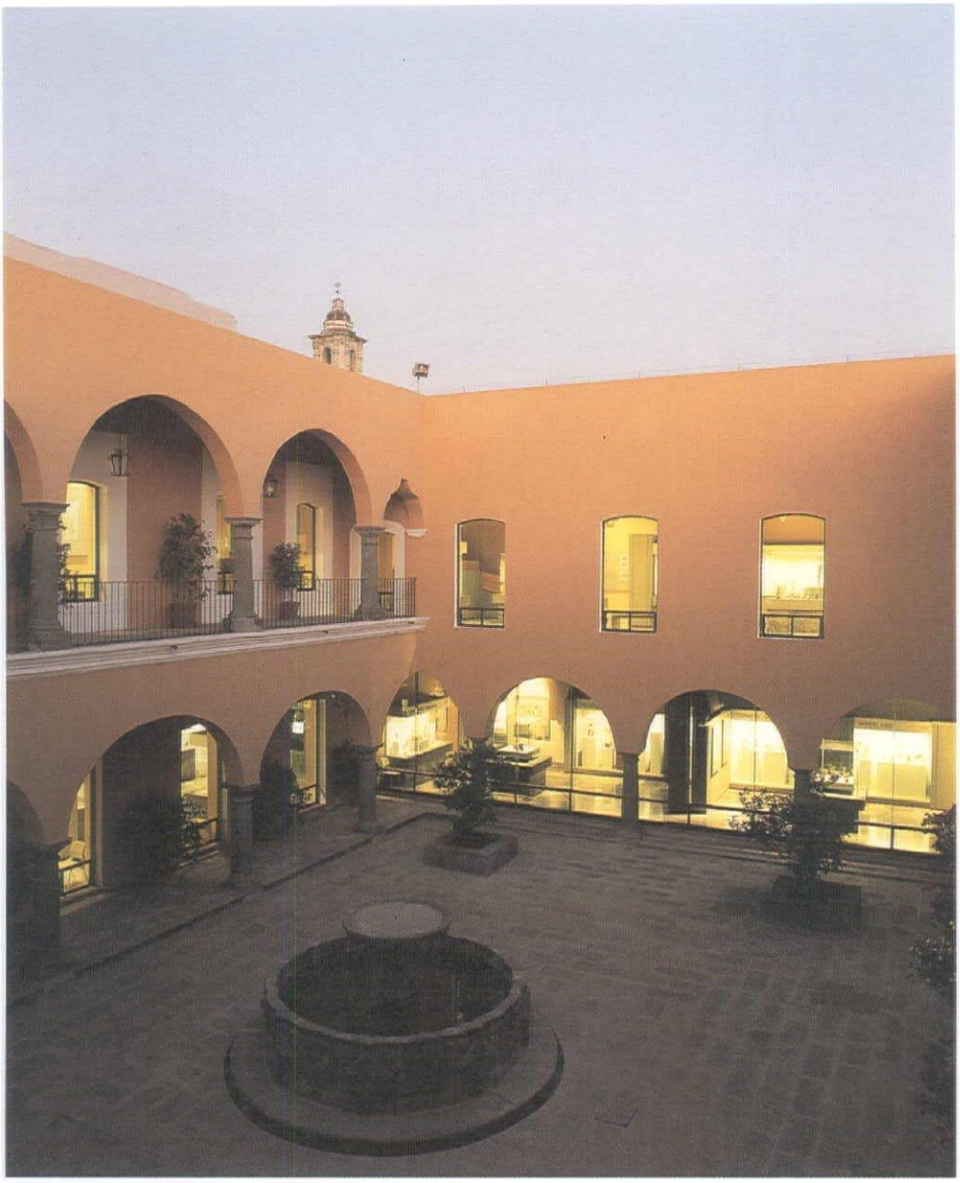
Challenge: The designers considered that the integrity of the Cour Napoléon should be respected without compromising full provision of the services required.

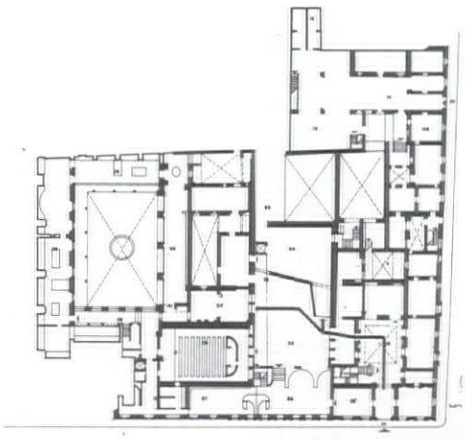
Solution: The underground service facilities were to be accommodated below a translucent roof 1.5 metres above ground level, supporting a large pool with fountains.

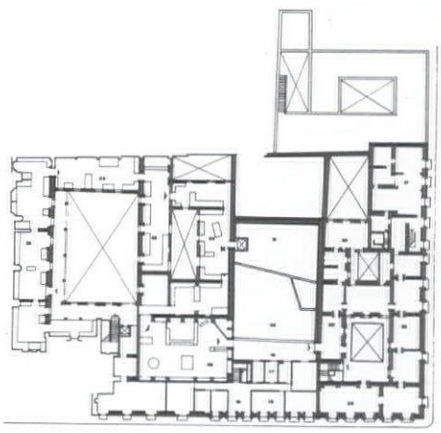
Date: 1985

Other factors: The design chosen by President Miterrand was that designed by Pei Cobb Freed & Partners.

Hector Velasco Facio







Above *View of the main courtyard.* ***Top right*** *First floor plan.* ***Above right*** *Ground floor plan.* ***Left*** *Interior of one of the exhibition rooms*

Amparo Museum

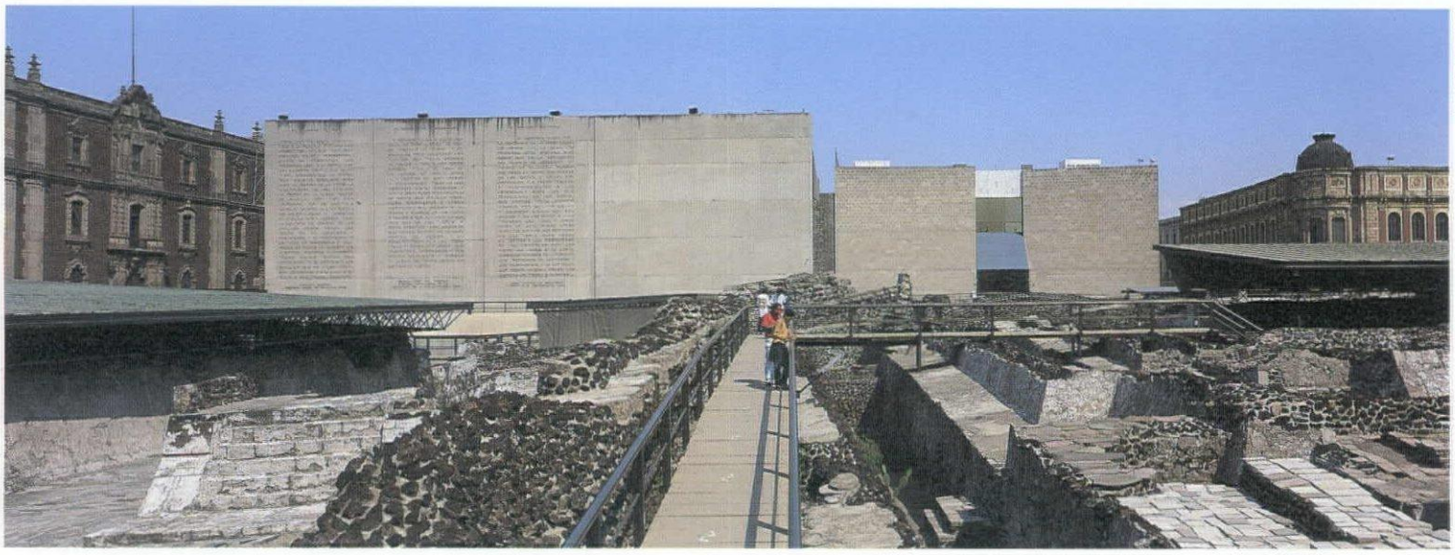
Co-authors: Javier Ramírez Campuzano, Andrés Giovanini García, Rafael Ramírez Ibañez

Brief: Restoration of three seventeenth and eighteenth century houses in the city of Puebla to house an important collection of pre-Hispanic art.

Challenge: The design had to respect the integrity of the existing buildings while making provision for modern display methods and technology. It had to be possible to accommodate temporary exhibitions without disrupting the Museum's normal operation.

Solution: Profusion of patios of different proportions enrich the project and allow varying activities to be naturally accommodated.

Date: 1988-1991



Hector Velasco Facio

Templo Mayor Museum

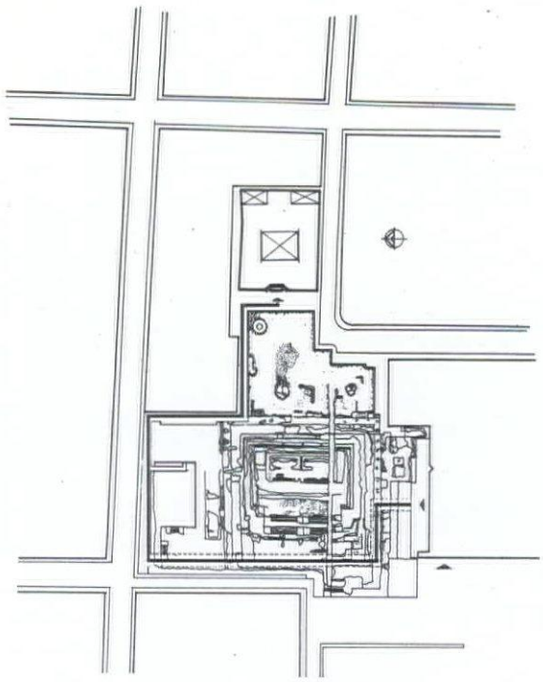
Co-authors: Javier Ramírez Campuzano, Guillermo Gutiérrez Esquivel, Miguel Angel Fernández

Brief: A museum to display over 7,000 items found in the ruins of the Aztecs' most important temple, newly-discovered in the centre of Mexico City.

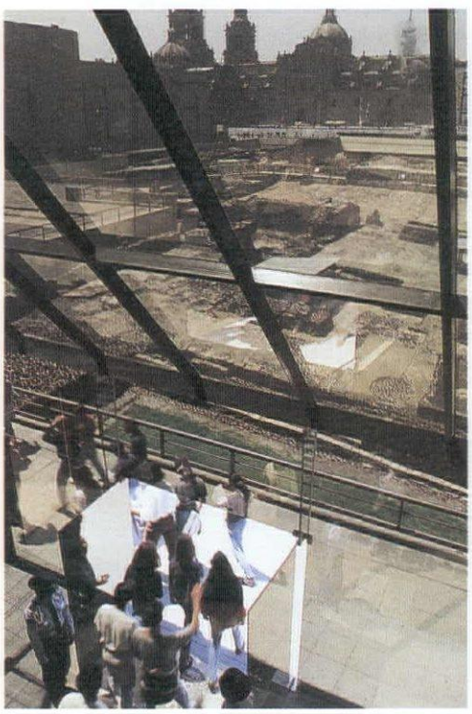
Challenge: The building had to give the visitor a dramatic sense of the impact of the archeological discovery.

Solution: The Museum's plan and section refer explicitly to that of the original temple. A model of central Tenochtitlán (Mexico City) in the time of the Aztecs is visible from all levels of the Museum.

Date: 1987

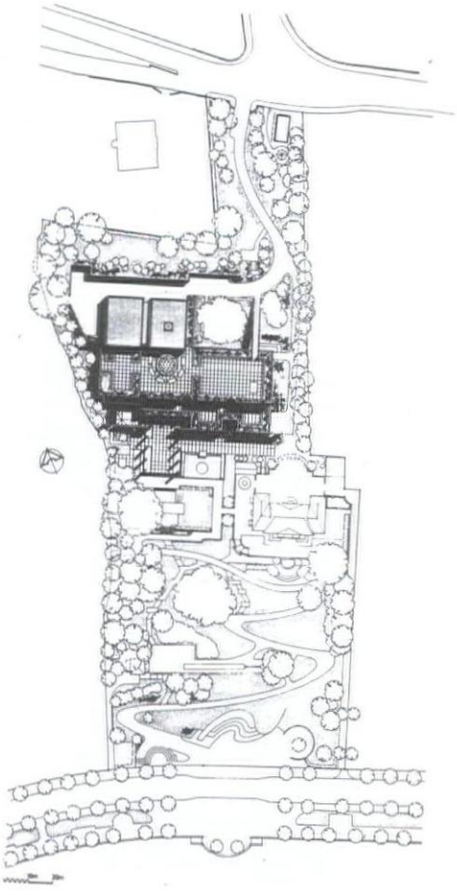


Above *The Museum seen from across the site of the Aztec temple.* ***Left*** *Site plan.* ***Below left*** *Visitors can view the site from within the Museum.* ***Below*** *Interior of the Museum*

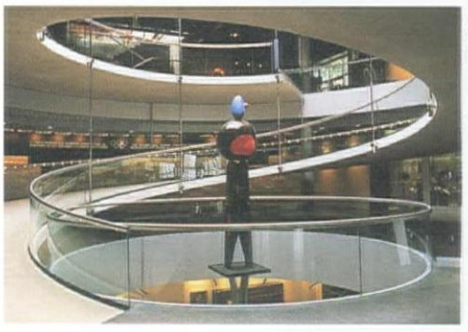


Hector Velasco Facio

CIO/Strahm



Above *The entrance facade of the Museum clad in Greek white marble in reference to the origin of the Olympic games.* ***Left*** *Site plan.* ***Right*** *Ramps enable vertical movement through the Museum*



CIO/Strahm

Olympic Museum

Co-authors: Javier Ramírez Campuzano, Jean Pierre Cahen

Brief: Museum of the history of the Olympic movement situated in Ouchy/Lausanne on the shores of Lake Geneva. To include 3,400 square metres for permanent exhibitions; Olympic Study Centre Library; multi-media film, video and photo libraries, Olympic archives and documentation; and a 180-seat auditorium.

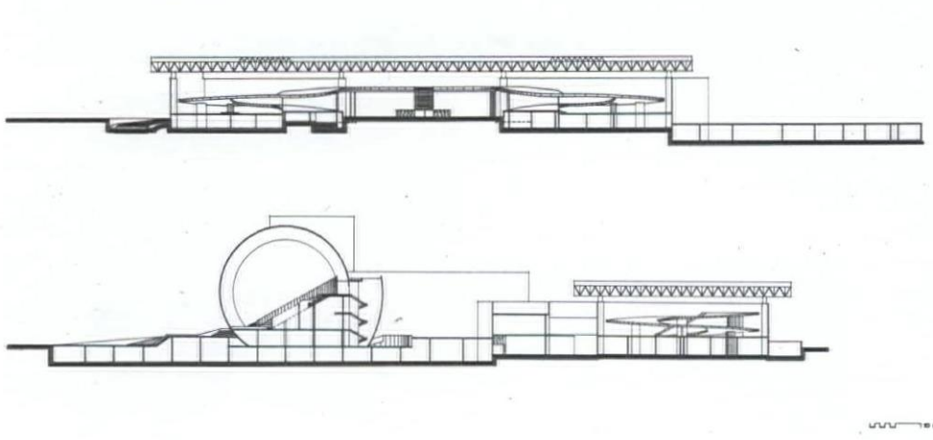
Challenge: The Museum had to blend sensitively with the topography of a large public park overlooking Lake Leman. The interior had to accommodate state-of-the-art display technology: robots, touch screens and interactive terminals, video-discs, photo CDs, and CD-ROM.

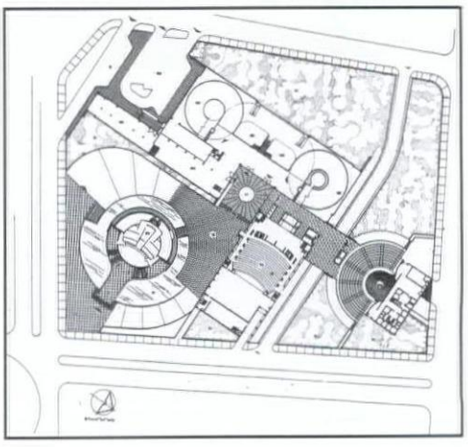
Solution: The building is designed as a series of terraces, preserving views of the lake and French Alps and distributed over five levels, two of them below ground. White Greek marble is used throughout as an expression of the origin of the games and of the purity of the Olympic ideals. Inside, a helicoidal ramp leads to the museum areas, allowing either sequential or independent visits to each room.

Budget and actual cost: SFr 118,120,937

Date: 1984-1993

Other factors: European Museum of the Year Award 1995 (Under the auspices of the Council of Europe).





Tijuana Cultural Centre

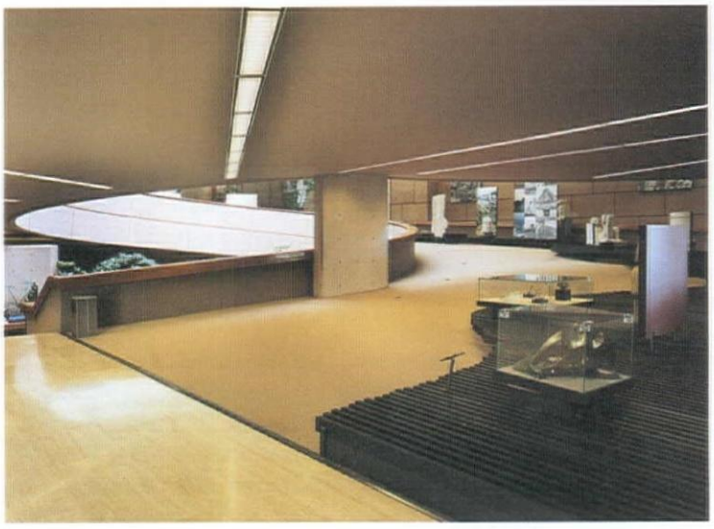
Co-author: Manuel Rosen Morrison

Brief: Cultural centre near border with USA.

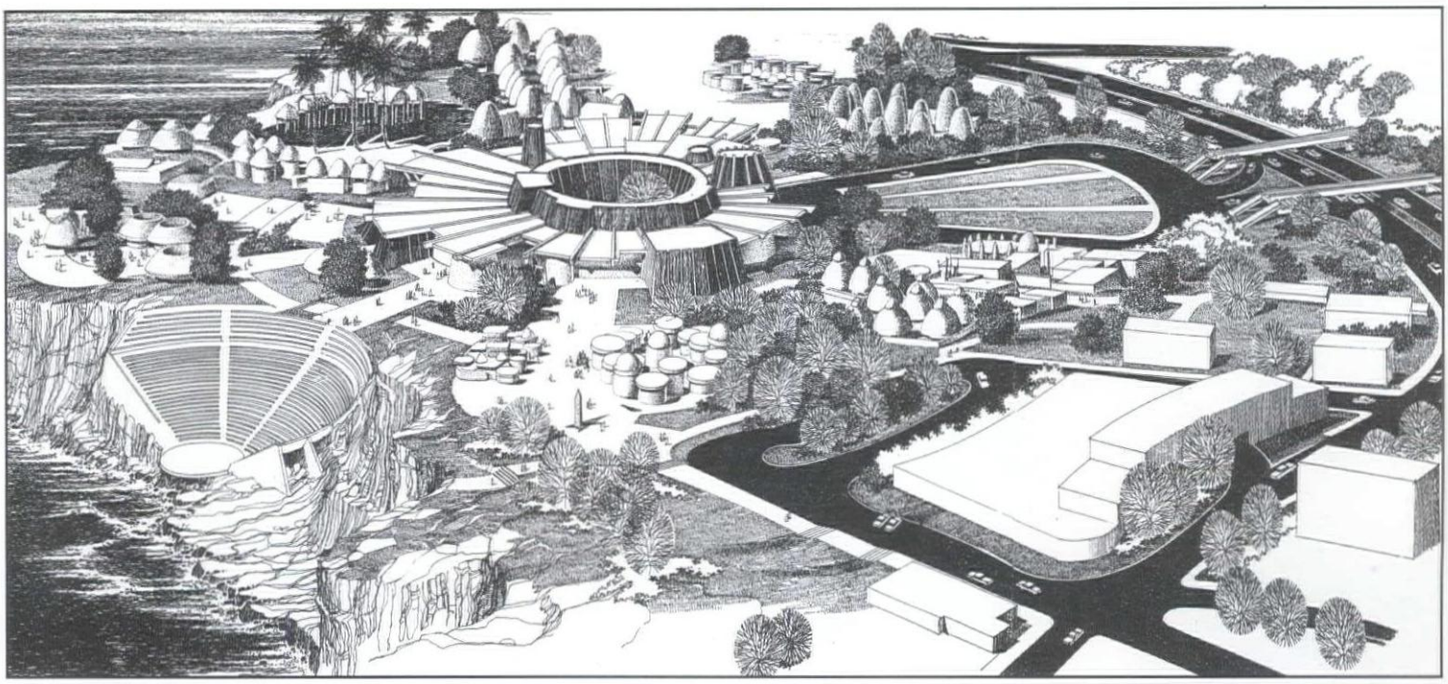
Challenge: Because of the rapid growth of Tijuana and its enormous floating population, the building was intended to act as a "bastion of Mexican culture".

Solution: Pure geometric forms comprise various units, ordered around a "gravitational centre" in the form of a spherical Omnimax cinema.

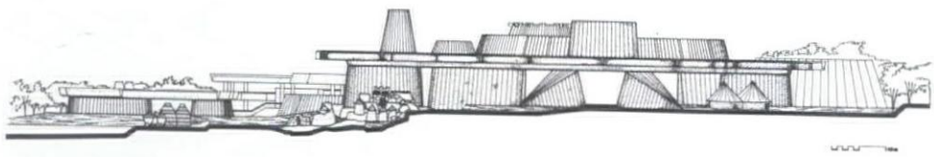
Date: 1980-1982

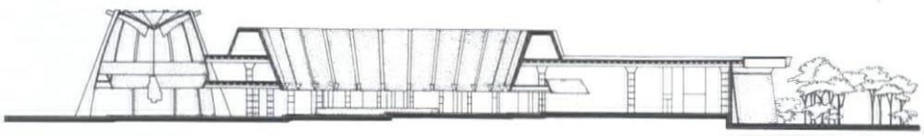


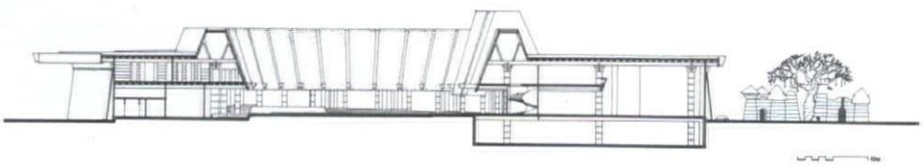
Top *The Sphere of the Omnimax cinema dominates the site.* ***Above*** *Sections and site plan.* ***Left*** *One of the twin ramps in the main exhibition building*



Above and bottom left *Circular forms used throughout the Museum complex echo traditional Senegalese buildings.*
Left *Sections*







Museum of Black Civilisation

Co-authors: Thierry Melot, Jorge Campuzano, Andrés Giovanini García

Brief: Museum to celebrate African civilisation situated on the coast of Dakar which faces the island from which slave ships departed for America.

Challenge: The Museum had to find an appropriate form to do justice to the character of African culture.

Solution: The concept was developed around the Senegalese tradition of the *penc*, a grouping of circular spaces forming a meeting centre for social and cultural activities in villages. Construction was to be in concrete, finished in African hardwood.

Date: 1972. Currently under construction.

IOC Offices, Lausanne

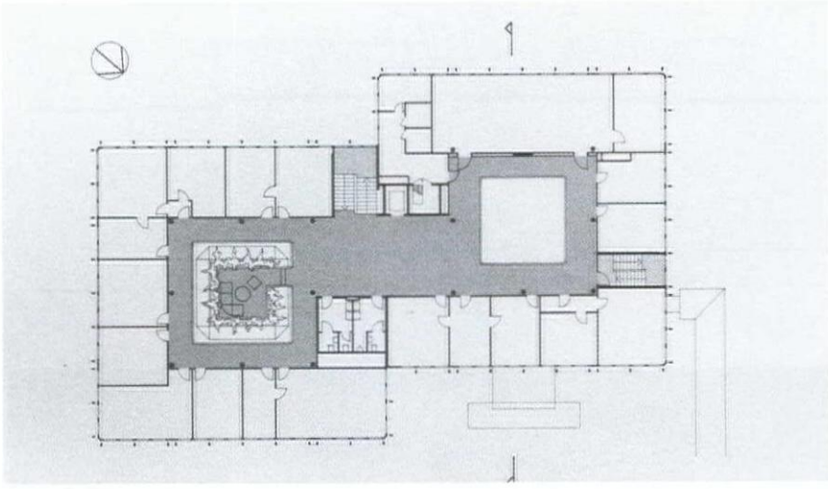
Co-authors: Jean Pierre Cahen, Javier Ramírez Campuzano, Jean François Clavel

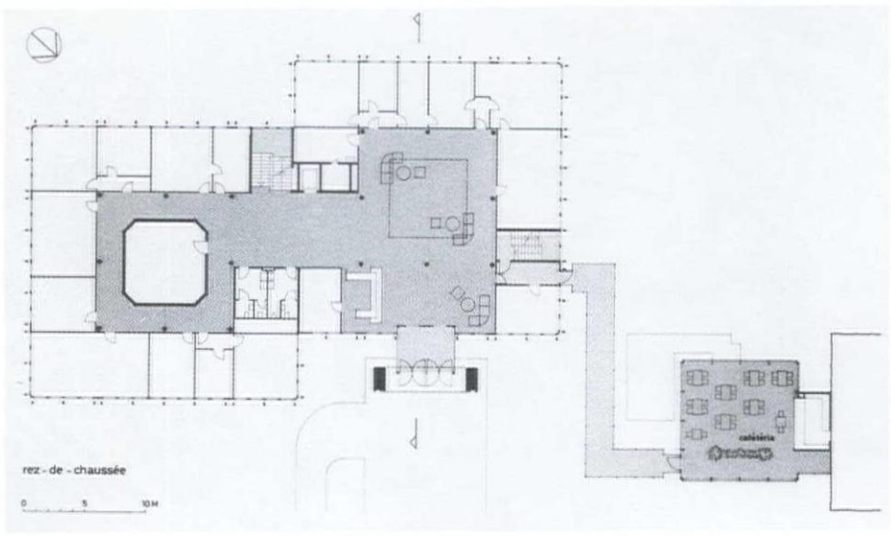
Brief: Administrative headquarters of the International Olympic Committee.

Challenge: At 3,500 square metres in area, the building had to merge discreetly with its site in the wood next to the Château de Vidy

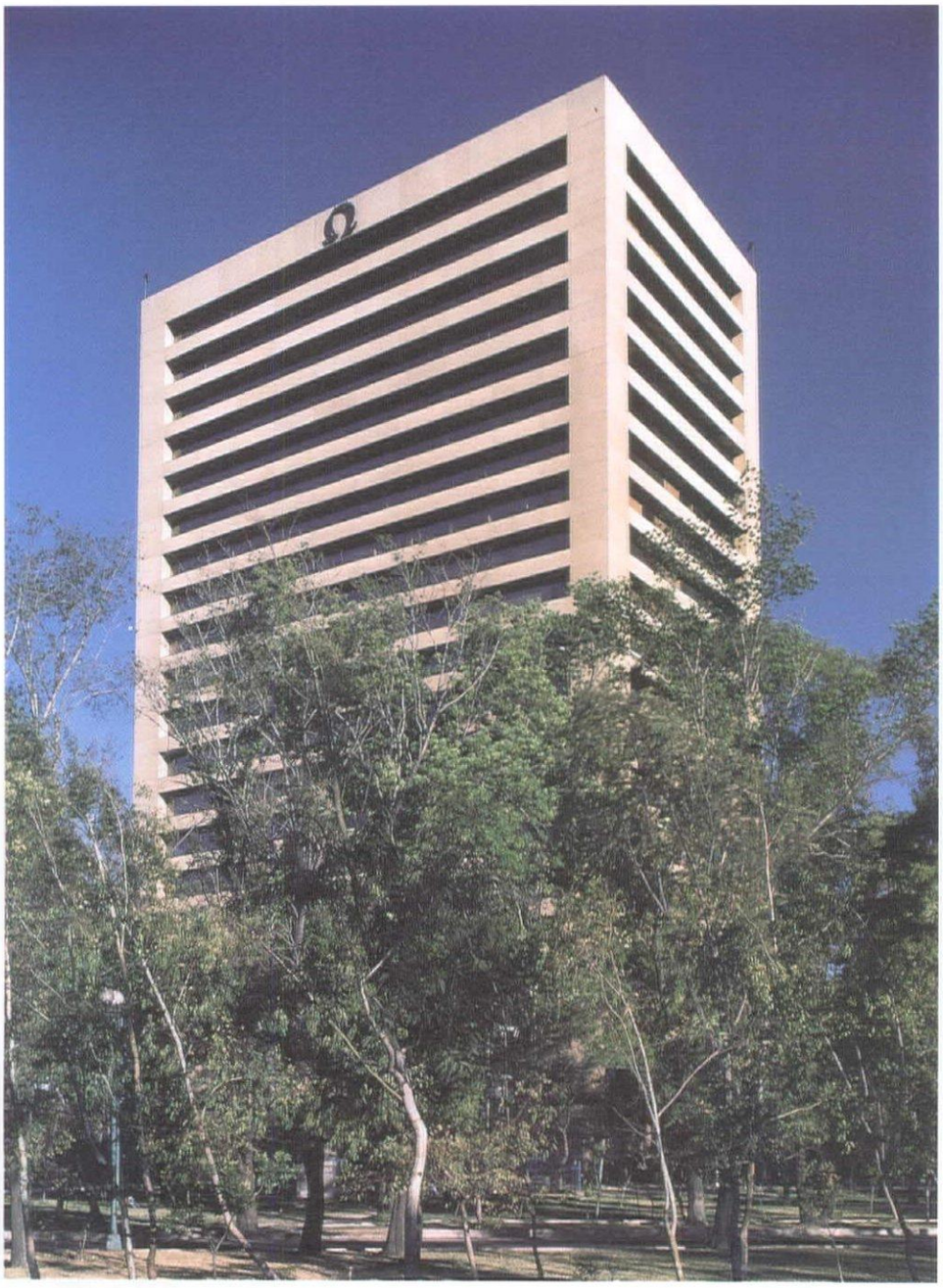
Solution: Elevations are predominantly in sepia tinted reflective glass, which renders the building partially invisible, with the exception of the white Greek marble entrance surround that symbolises the origin of the Olympics.

Date: 1985-1986





Top *The entrance to the tinted glass building is marked by an archway of Greek marble decorated with the Olympic symbol.* ***Above right*** *First floor plan.* ***Right*** *Ground floor plan*



Omega Building

Co-authors: Guillermo Gutiérrez Esquivel

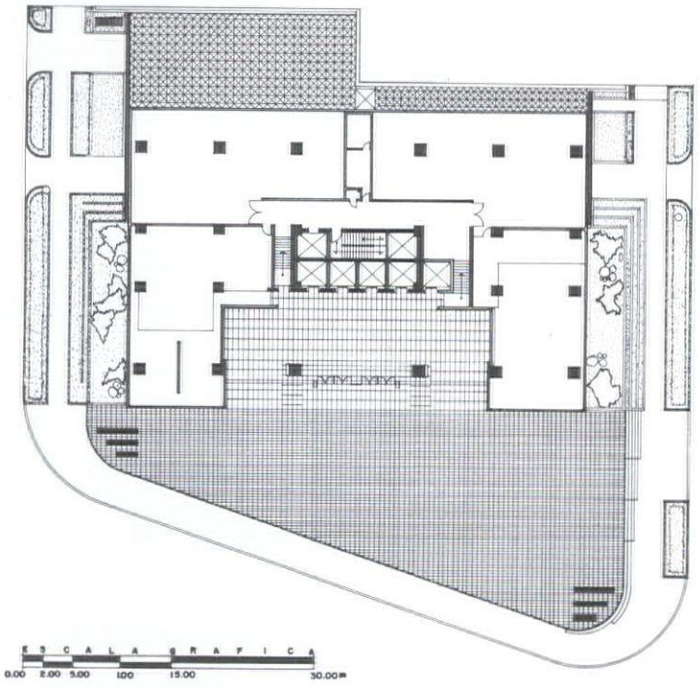
Brief: Mexican headquarters for Swiss watch company.

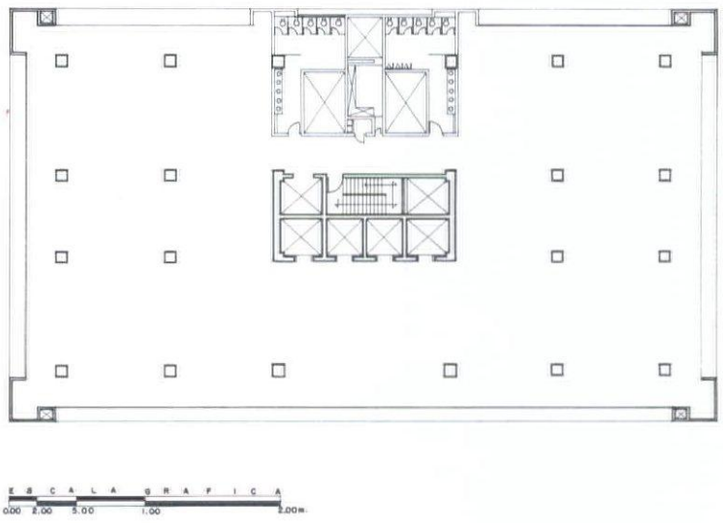
Challenge: The offices had to take advantage of its site, next to the Forest of Chapultepec.

Solution: The building is placed at the rear of the site to allow a plaza facing the park. Horizontal strip windows allow maximum visibility of the park, while being shaded from the sun. Detailing is intended to be formal but clear and synthetic, conveying the impression of Swiss precision.

Date: 1984-1985

Left *Deep-set horizontal glazing allows panoramic views while protecting the interior from the sun.* ***Below left*** *Ground floor plan.* ***Below*** *Typical floor plan*





Mexicana Building

Co-authors: Rafael Mijares Alcérreca, Andrés Giovanini García

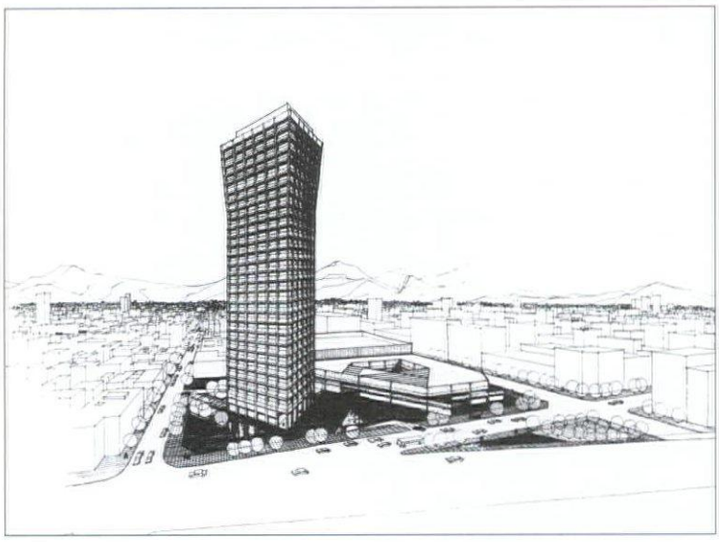
Brief: Airline headquarters building.

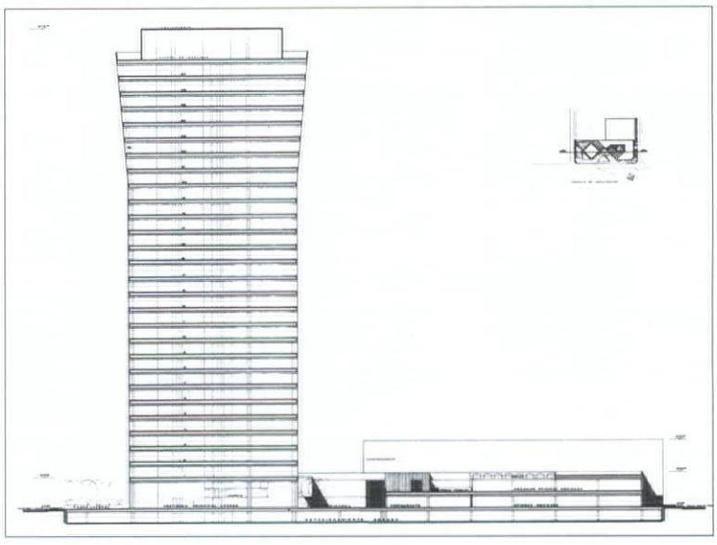
Challenge: The building had to find a form evocative of its function.

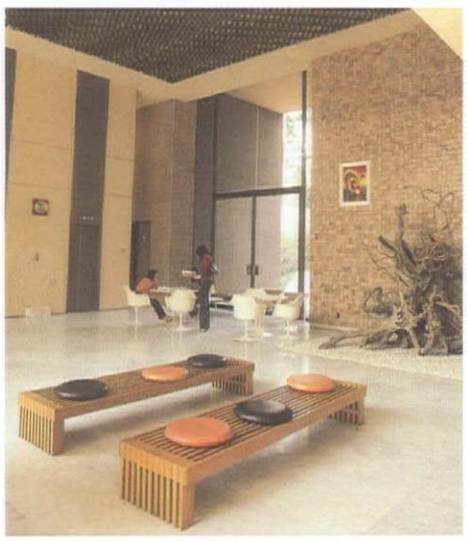
Solution: The complex comprises two large units: a lower horizontal building containing all large-scale and public activities such as airline reservations, and a tower which above a certain point tapers outwards like an airport control tower.

Date: 1979-1984

Right *The tower of the Mexican national airline headquarters evokes an airport control tower.* ***Below*** *Perspective sketch.* ***Below right*** *Section through tower and low-rise office building*







Above *The exterior blends Mexican and Japanese forms.* ***Left*** *The tranquil interior of the foyer*

Japanese Embassy

Co-authors: Manuel Rosen Morrison, Kenzo Tange, Rafael Espinosa

Brief: Embassy building on the Paseo de la Reforma.

Challenge: The building had to find a form uniting Japanese and Mexican traditions.

Solution: The facade combines Tange's characteristic articulation and Mexican large-scale masses.

Date: 1975-1976

Congress of the Union

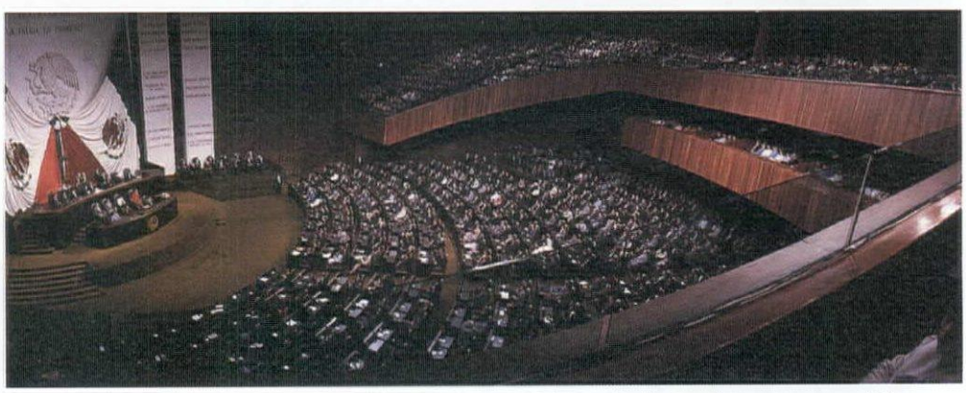
Co-authors: David Muñoz, Pedro Beguerisse, Jorge Campuzano

Brief: Complex to house Mexico's Chambers of Deputies and Senators.

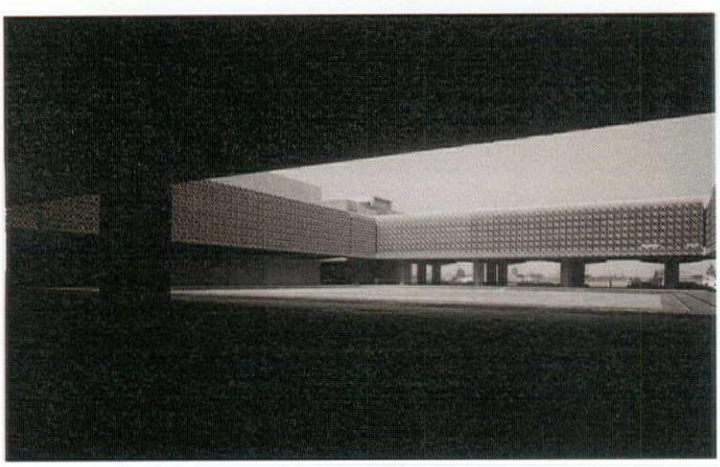
Challenge: The building had to meet the brief's functional demands while also doing justice to its Mexican identity and its inevitable symbolic importance.

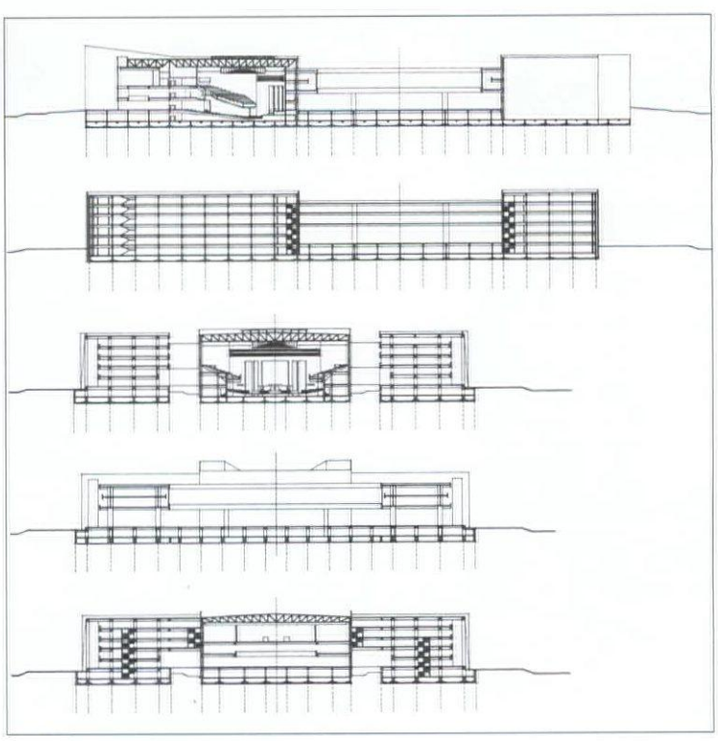
Solution: The building's concept is simple and legible. The entrance lobby is dominated by a mural by José Chávez Morado. The main facade is finished with quarried stone from Los Remedios, red tezontle volcanic stone and a large circular mural in bronze.

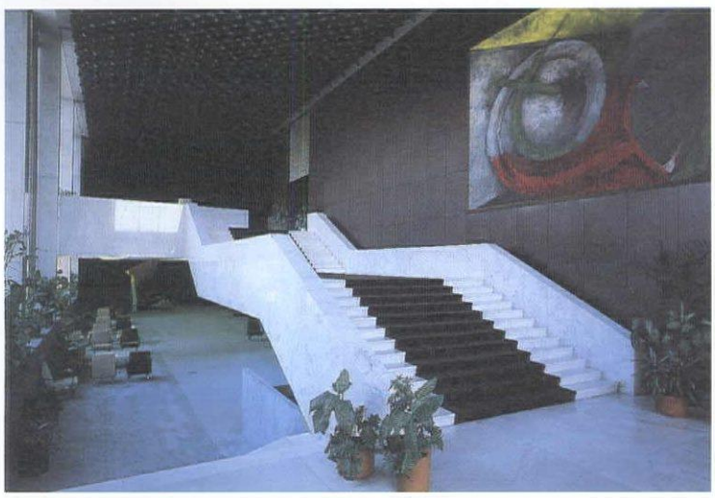
Date: 1978-1980



Top *The main facade with huge bronze medallion over the entrance.* ***Above*** *Interior of the Chamber of Deputies.* ***Below left*** *Colonnades run down both sides of the building.* ***Below*** *Sections*







Top *The simplicity of the Ministry building complements the neighbouring ancient Aztec ruins.* ***Above*** *The main staircase leading to the first floor of the "plinth".* ***Below*** *Ground floor plan.* ***Below right*** *Block plan*

Ministry of External Relations

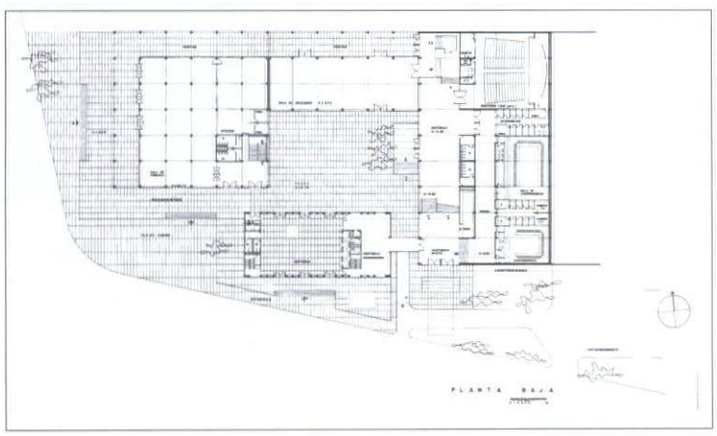
Co-authors: Rafael Mijares Alcérreca

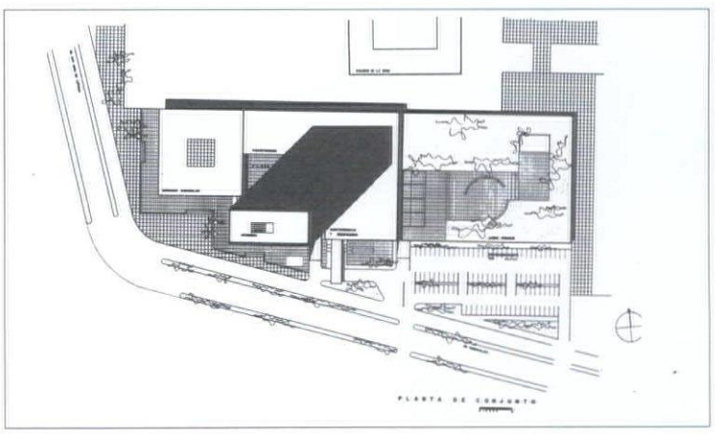
Brief: Mexican Chancellery containing offices and formal accommodation for the reception of foreign representatives.

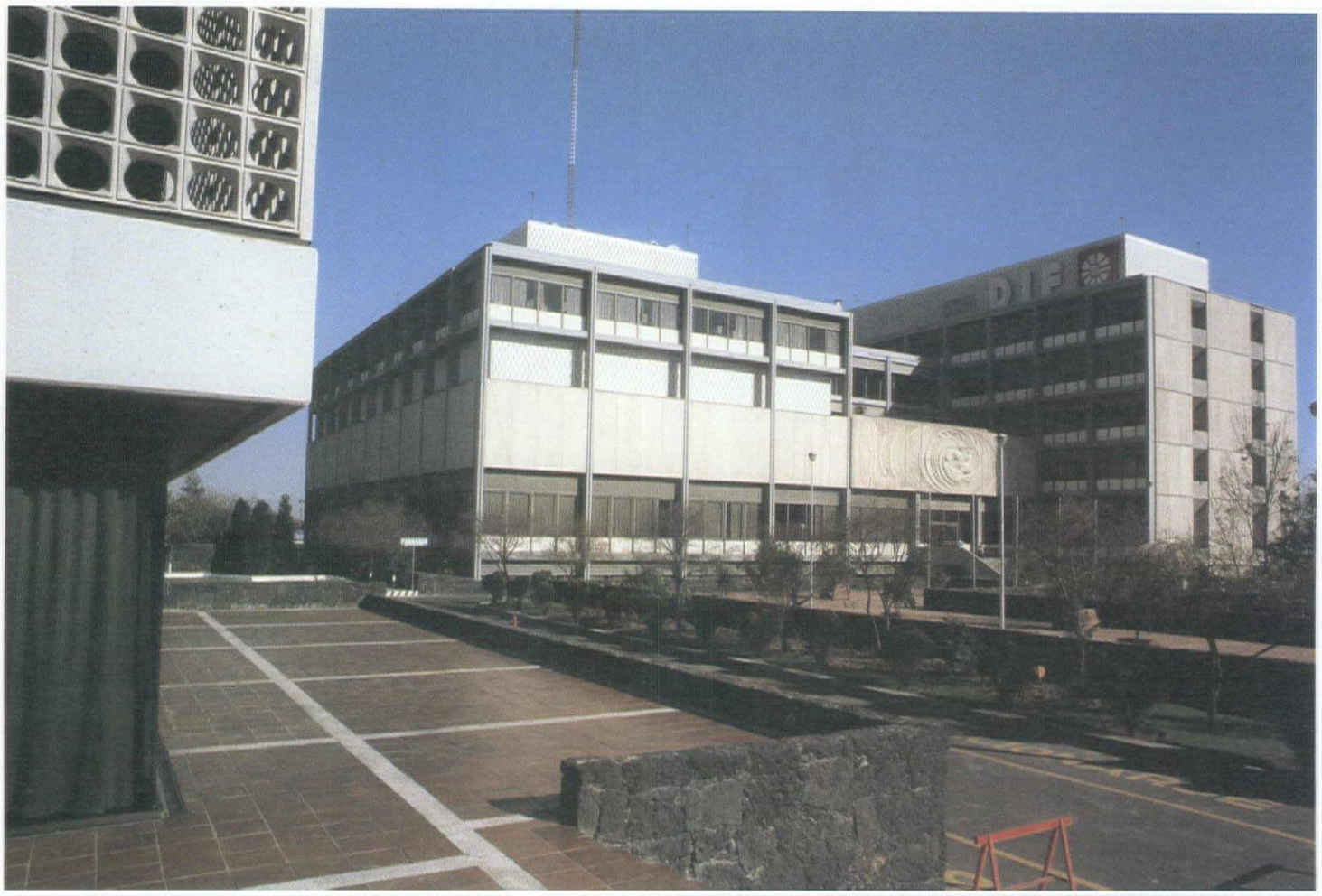
Challenge: The building is sited next to the Aztec remains of Tlatelolco and the sixteenth century church of Santiago, and had to provide 14,000 square metres of accommodation without damaging the amenity of the site.

Solution: The building is split into four volumes: a 20-storey tower flanked by three structures creating a 12 metre high plinth. This complex coexists assertively but respectfully with the adjacent historical structures. Together they form the Plaza de las Tres Culturas.

Date: 1965-1968







Above The Hospital was made less intimidating by breaking it down into more comprehensible units. ***Below right*** A series of "playful" pictograms was developed to identify different parts of the Hospital. ***Below left*** Site plan

IMAN Hospital

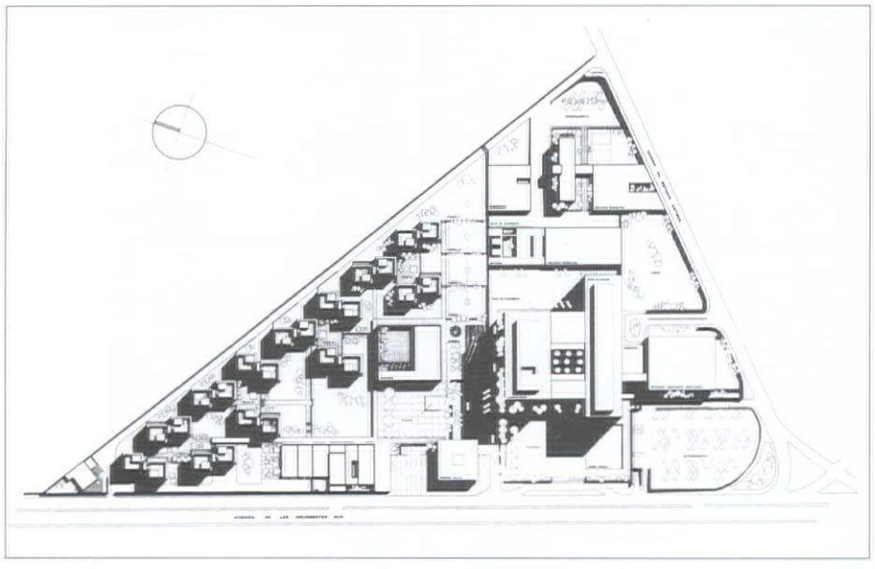
Co-authors: Rafael Mijares Alcérreca, Renato Chacón, Eduardo Graef, Víctor Lara

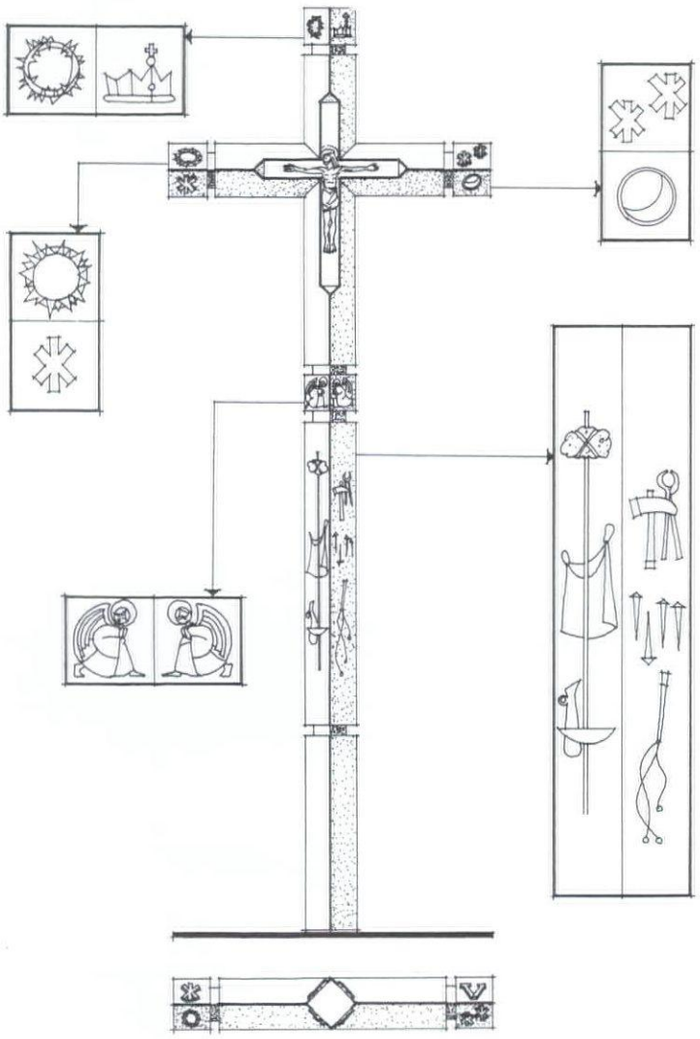
Brief: A centre for the preventive treatment and care of infants.

Challenge: The Hospital had to provide an exemplary level of care while creating a playful, non-intimidatory environment that parents, visitors and children could find their way around. Ideally, children should have the impression that they were not in a hospital.

Solution: In this building, Ramírez Vázquez's interests in architecture and graphic design are unified. The complex is broken down into comprehensible units. A complete pictographic orientation system by Susan Smith was developed at three levels: for parents and visitors, for children, and for staff.

Date: 1968-1970





Above *The Chapel is typically Mexican in form, and its construction and decoration uses Mexican materials.*
Below left *Detail drawing of Chapel crucifix*

Chapel of the Virgin of Guadalupe in Rome

Co-authors: Andrés Giovanini García, Javier Ramírez Campuzano, Fray Gabriel Chávez de la Mora

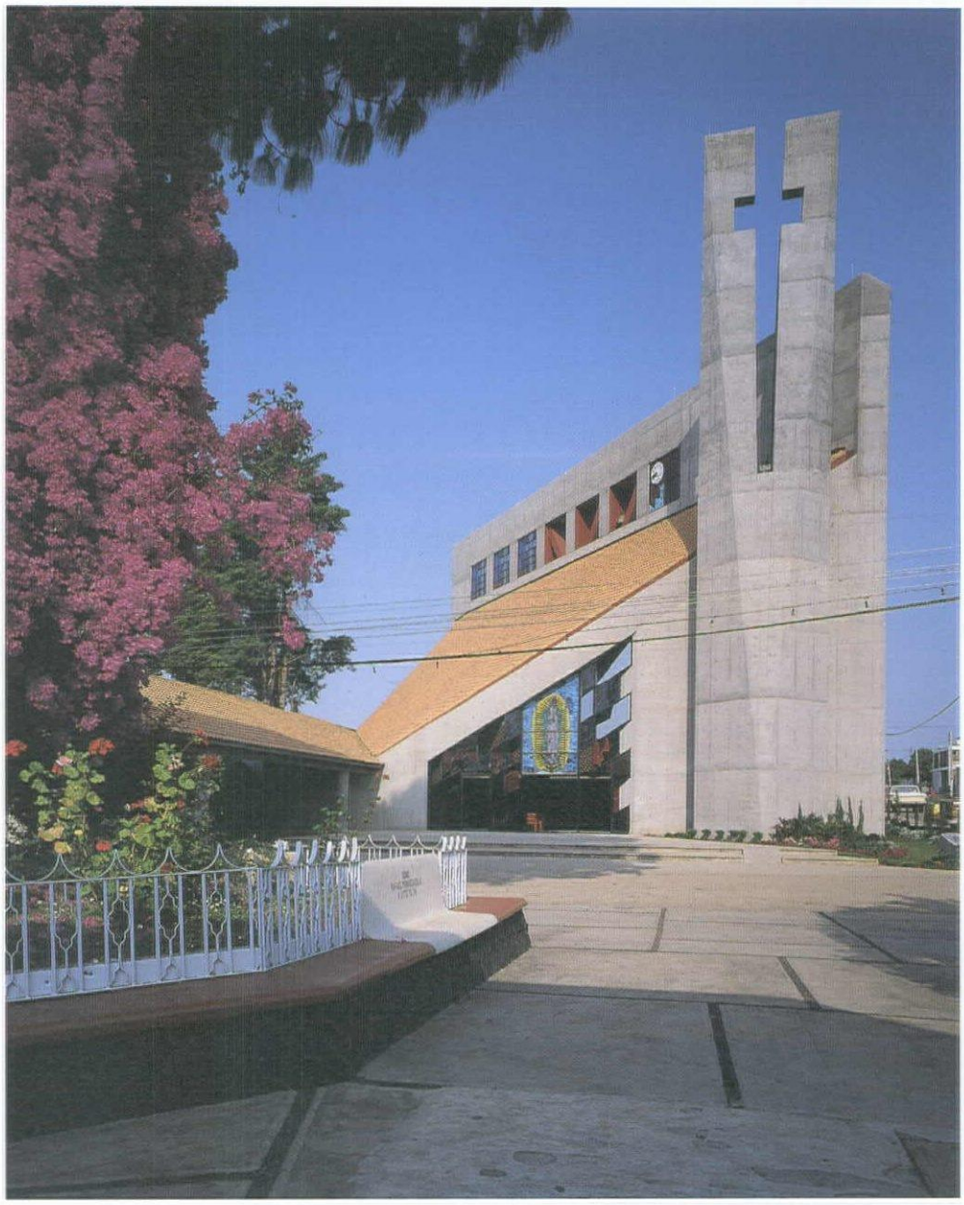
Brief: A chapel situated in the crypt of St Peter's next to the tomb of St Peter.

Challenge: The Chapel had to establish a Mexican theme and Mexican materials in a setting that could hardly be more sensitive.

Solution: Altar and ambo were built with stone coming from the Tepeyac, the place in Mexico where the Virgin of Guadalupe is said to have appeared. The cross and additional ornamental elements were made of silver by Mexican artists.

Date: 1989-1992

Right *Traditional church forms such as the high pitched roof and tower are given a stunningly modern interpretation.*
Bottom left *The patterns in the three-dimensional stained glass window appear to change as the observer moves.*
Bottom right *Block plan shows simple rectangular plan*



Tocumbo Parish Church

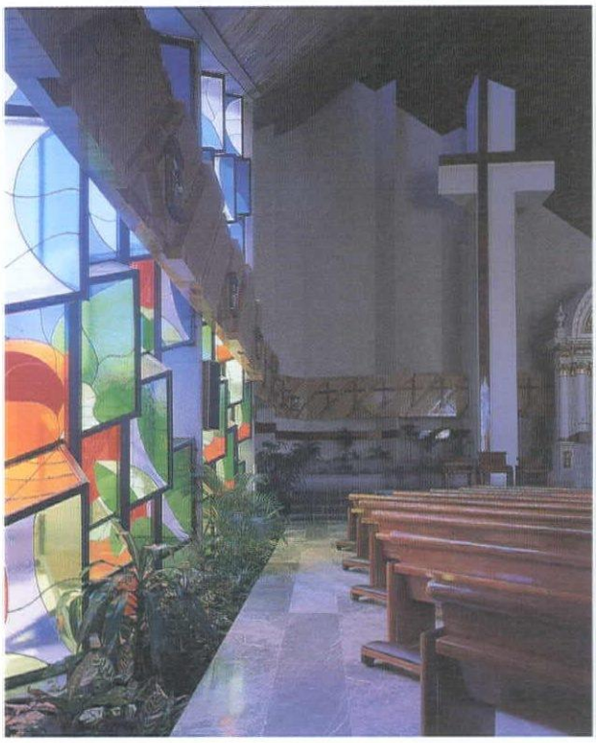
Co-authors: Andrés Giovanini García

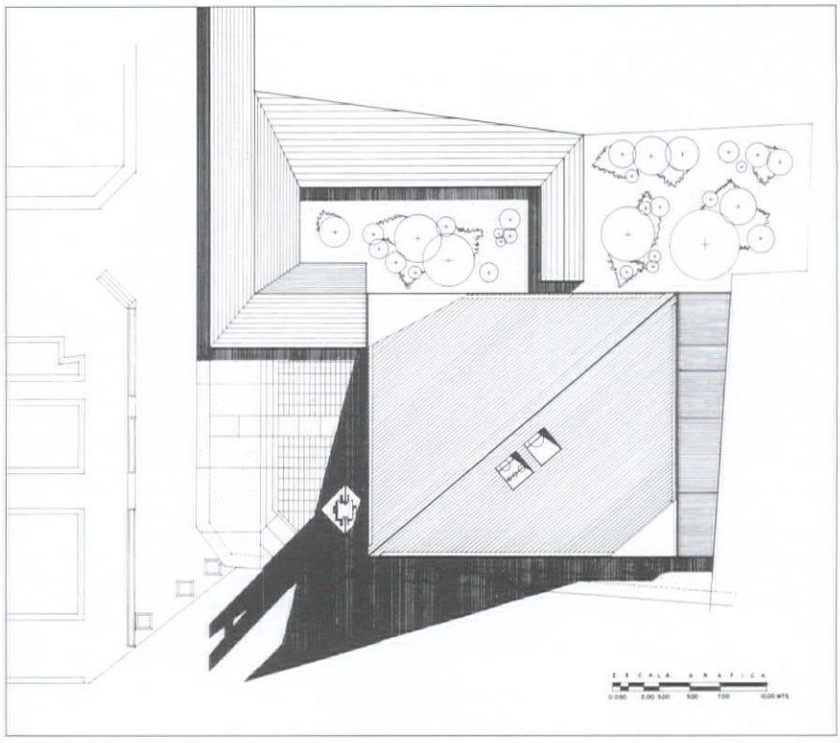
Brief: Parish church for a small town noted for its ice-cream industry.

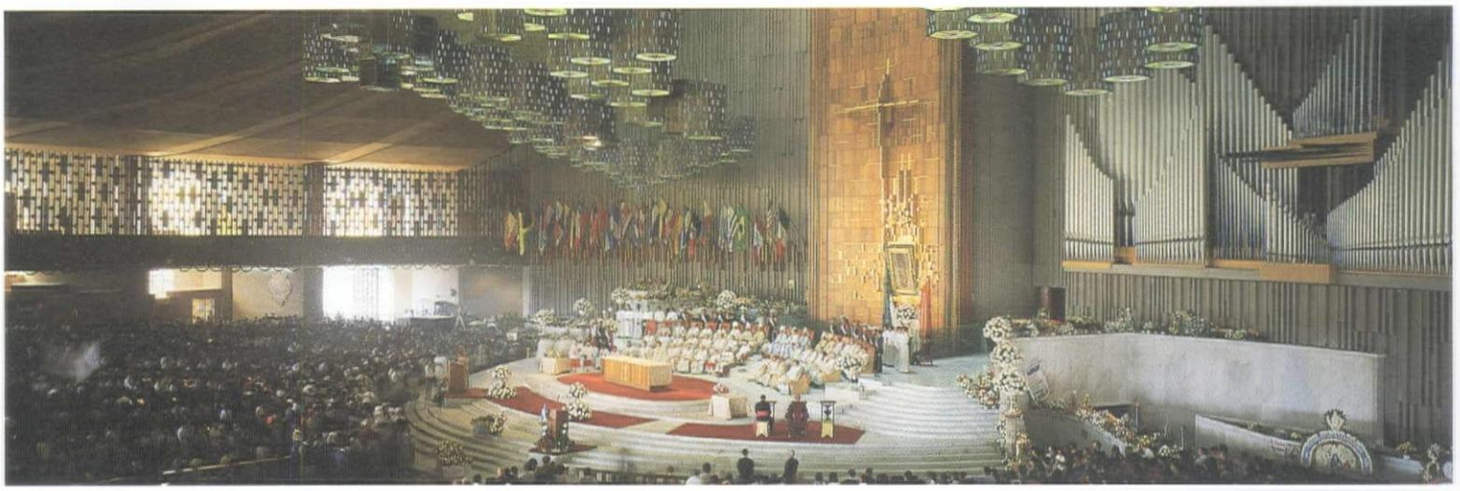
Challenge: The Church had to combine modernity with traditional characteristics such as pitched tiled roofs, high ceilings and use of natural wood.

Solution: Traditional cubic shapes are interpreted by large planes designed to amplify their dimension and presence. The stained glass windows in part coloured crystal and part mirrored glass have a three-dimensional design that appears to change as the observer moves. The portico doubles as an open chapel.

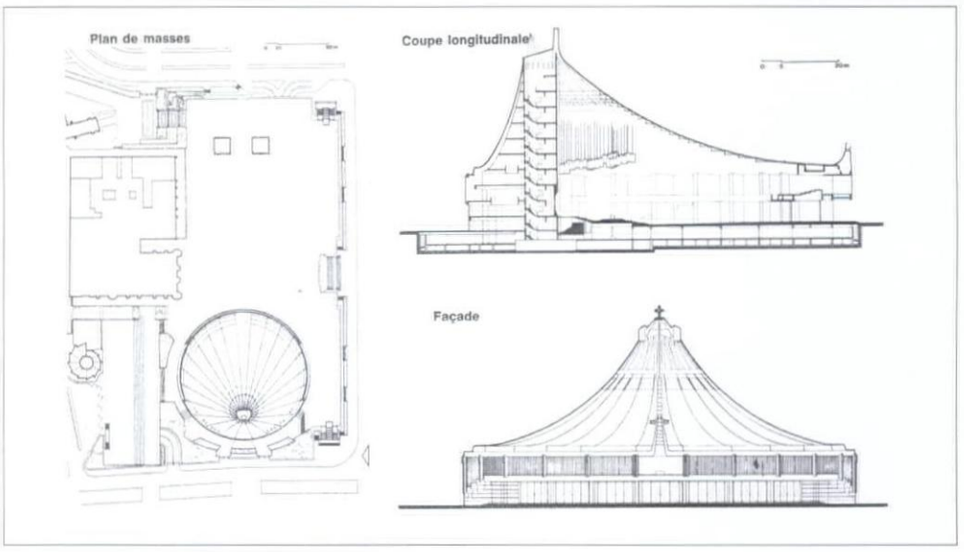
Date: 1987-1991







Top *The new basilica is situated next to the building it replaces.* ***Above*** *Conveyors beneath the altar enable people to visit the image of Our Lady of Guadalupe even during a mass.* ***Right*** *Site plan, section and front elevation*



Basilica of Guadalupe

Co-authors: José Benilliure, Gabriel Chávez de la Mora, Alejandro Schoenhoffer

Brief: New basilica for one of the holiest Catholic sites in the Western hemisphere. The existing shrine was suffering from settlement and overcrowding.

Challenge: Guadalupe's functional demands are unique. Twelve million people visit every year, and certain pilgrimage days can attract up to 70,000 visitors. All pilgrims wish for a close view of the miraculous image, so it is necessary that they can flow continuously past the image without interrupting the service. In addition the church authorities wanted to be able to allow separate masses to be said for special groups in full view of the image, but there was not time in the day for any one of them to monopolise the Basilica. Finally, the site was very susceptible to settlement, necessitating a resistant layer 32 metres deep.

Solution: The image is arranged to be visible not only from the Basilica, but also from four passenger conveyors mounted in parallel in the crypt and from seven "box" chapels at mezzanine level. The area of deep foundations was minimised by conceiving the structure in the form of a "tent" with the bulk of the load borne by the central "tent pole" behind the image. The Basilica is open at ground level, so that the image is visible from the plaza outside – it is characteristic of Ramírez Vázquez to allow controlled vistas from one space to another. Combined with openings at the top of the "tent pole" it also ensures effective stack ventilation.

Date: 1974-1976

Above and below *The Stadium seats 110,000, the largest number of seated spectators in the world. The concrete structure was unaffected by the 1985 earthquake*

Azteca Stadium

Co-author: Rafael Mijares Alcérreca

Brief: Football stadium for 110,000: the largest number of seated spectators in the world.

Challenge: The project was the subject of a limited competition. As it was to be privately funded, a key issue was how to finance it and require the minimum initial investment. Sightlines had to be optimal from any position.

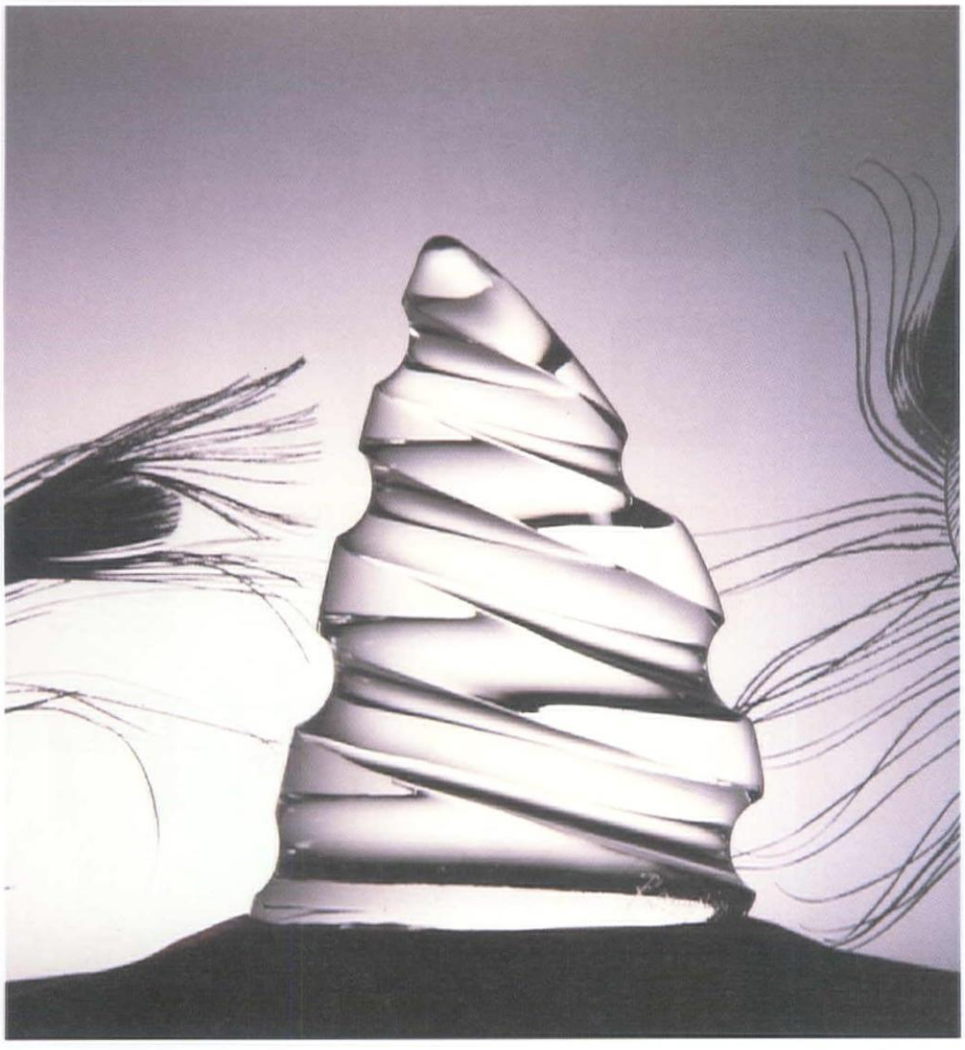
Solution: Ramírez Vázquez's design provided 660 private boxes in three levels. These were pre-sold from a model and have their own parking directly connected at the same level. This provided an income. The roof was to be built once the Stadium was in use, and funded from operating income. The concrete structure allows all elements to integrate and mutually support each other and was not affected by the earthquake of 1985.

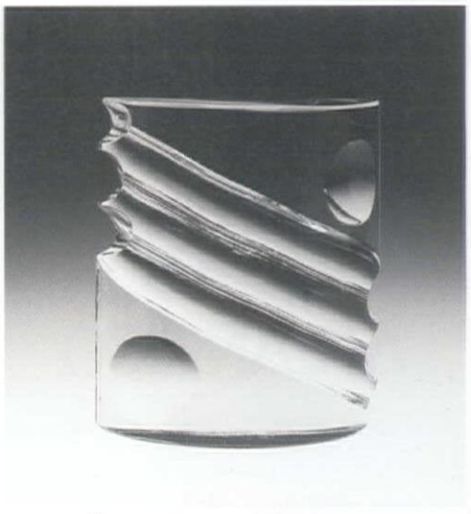
Date: 1963-1966 (remodelled 1986)

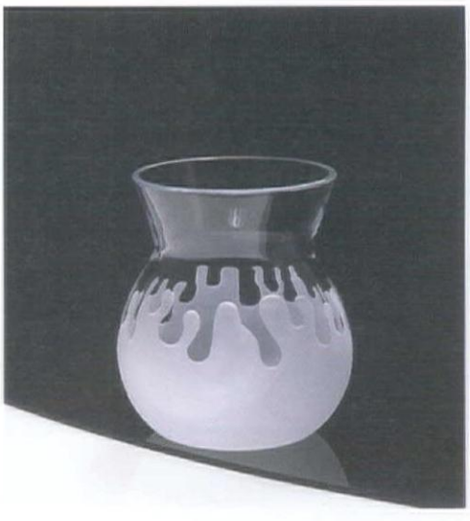
Other factors: The Stadium was used during the 1968 Olympic games and for the 1970 and 1986 World Cup championships.

Crystal glass design

Crystal glass is one of Ramírez Vázquez's favourite media for expressive design. Glass-blowing is an old tradition in Mexico, and characteristically, in this material Ramírez Vázquez seeks to create objects drawing equal inspiration from pre-Hispanic and modern sources.

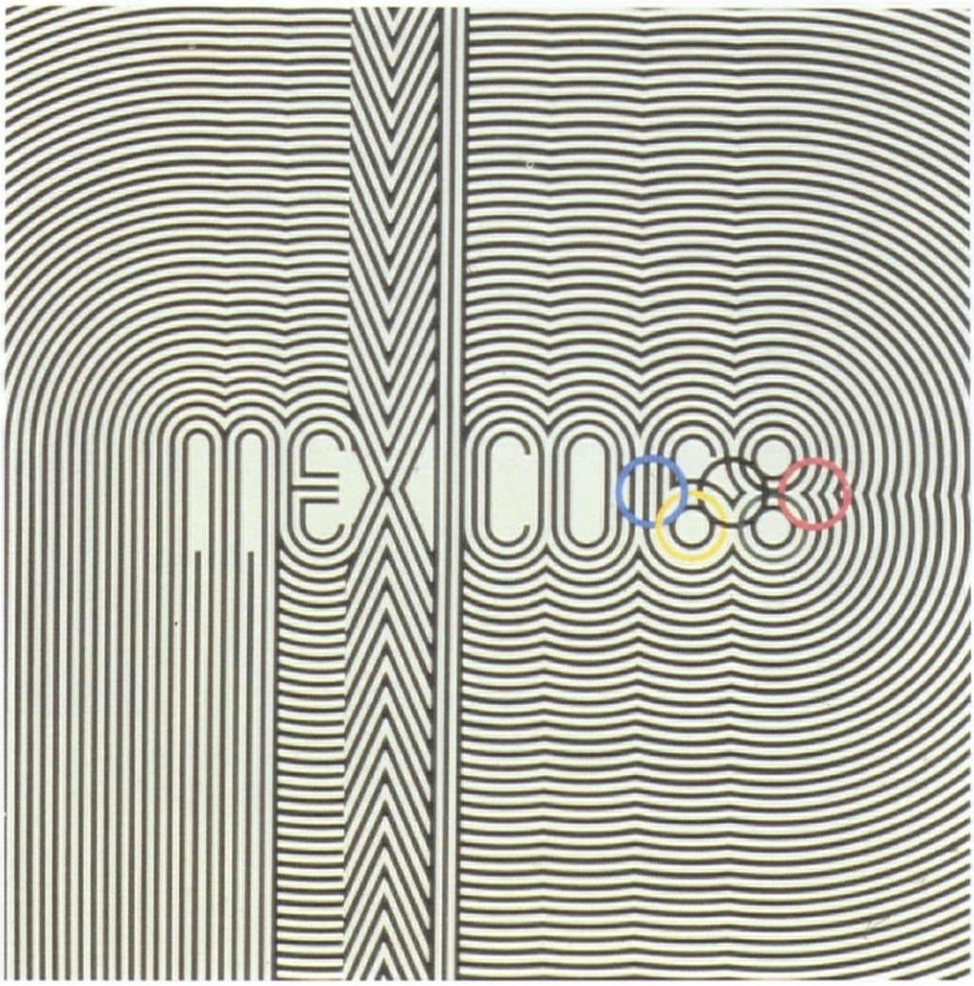




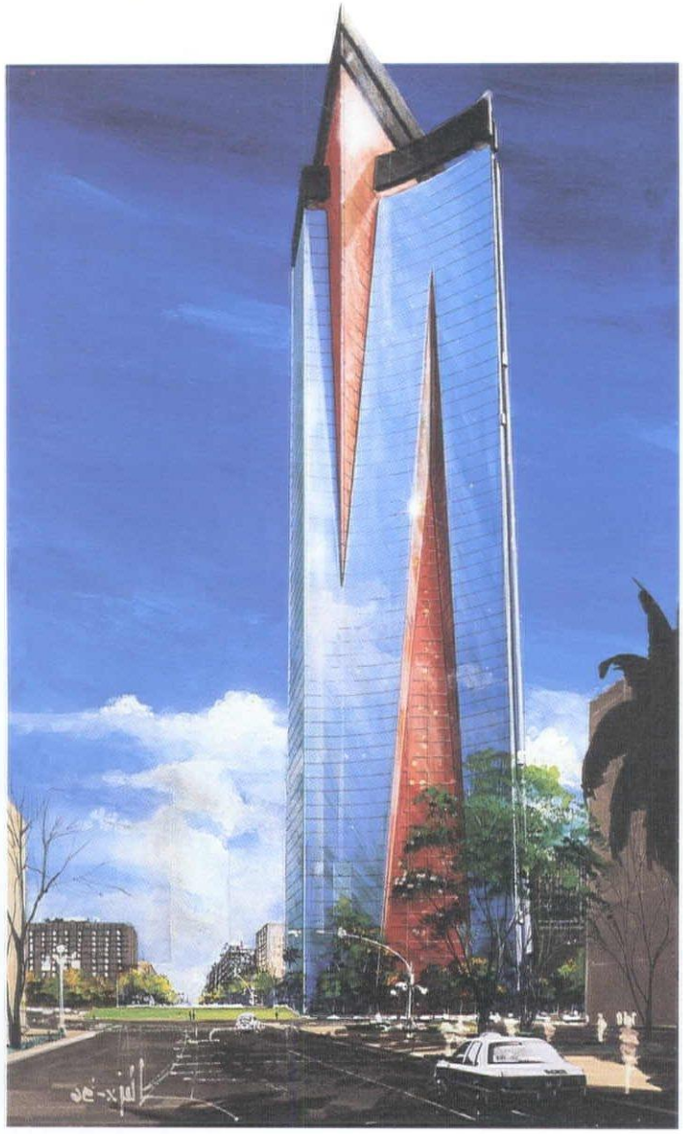


Graphic design

Ramírez Vázquez's work in graphic design takes its cue from the tradition for ornamental design in pre-Hispanic architecture, where ornament occurs in a form that follows many of the same rules of stylisation of modern graphic design. His work includes many of Mexico's most famous symbols, including those for Televisa, Banco Atlantico and the Mexican College of Civil Engineers. His most famous project by far was the corporate identity for the 1968 Mexico Olympics, where the exuberant typography was itself inspired by a pre-Hispanic seal design.



Francisco Uribe



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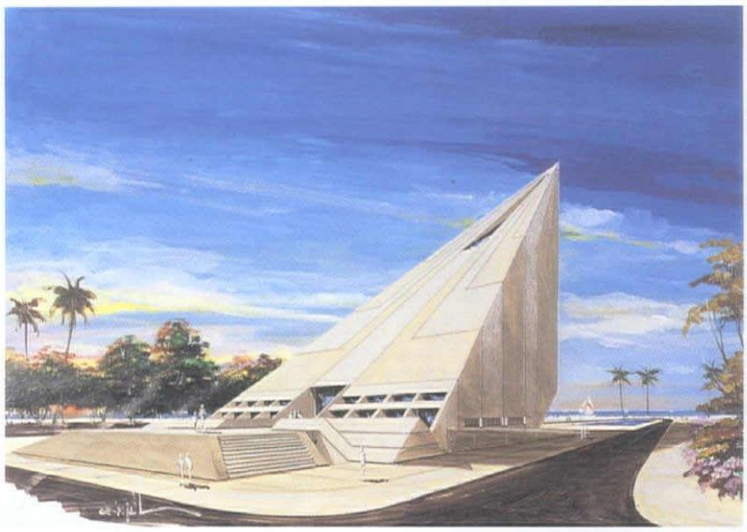

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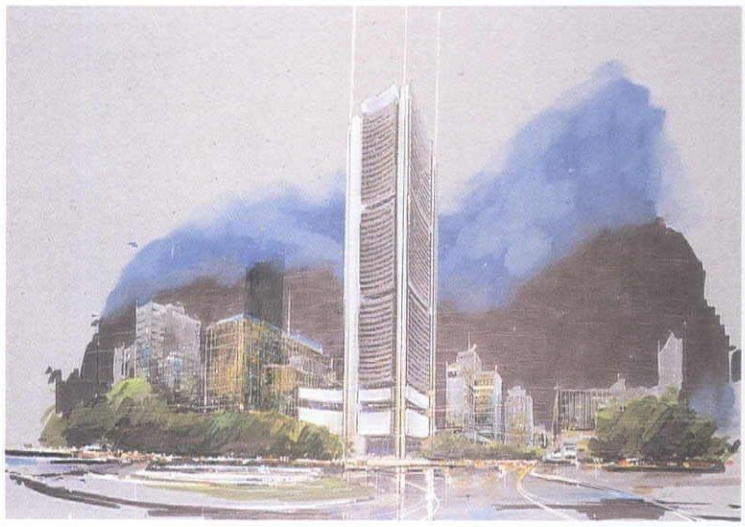
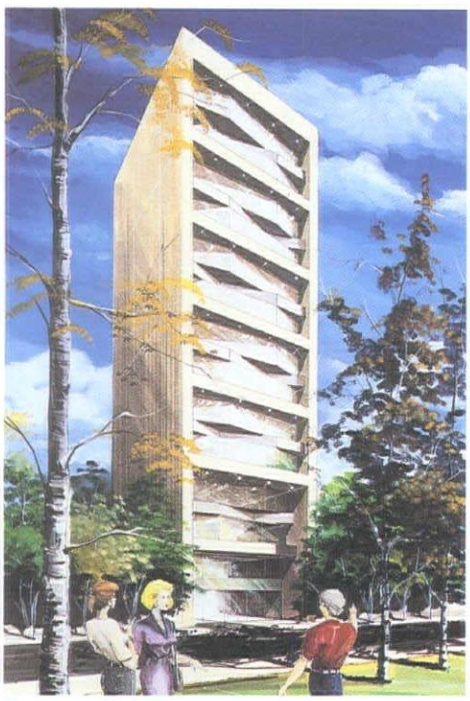


3

Future/recent projects

A selection of commercial and religious projects, recently designed and awaiting construction.

1 Office building, Insurgentes, Mexico City
2 Ecumenical church, Cancún, Quintana Roo
3 Office building, Reforma Norte, Mexico City
4 Tissot Building, Mexico City
5 Hotel, Monterrey, Nuevo León
6 Symbolic cross, Manzanillo, Colima
7 Hotel, Cancún, Quintana Roo



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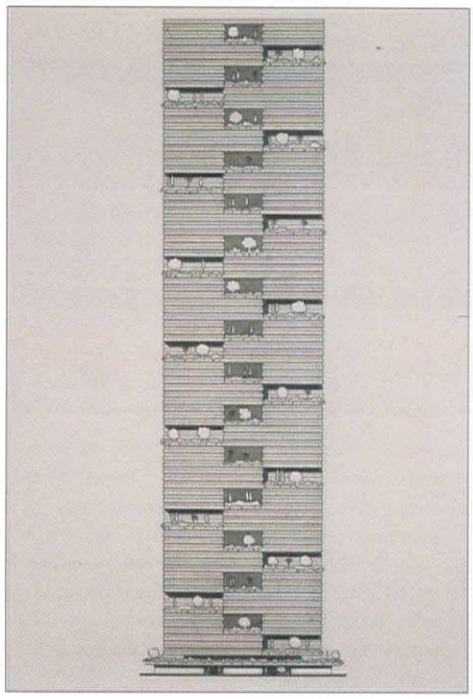

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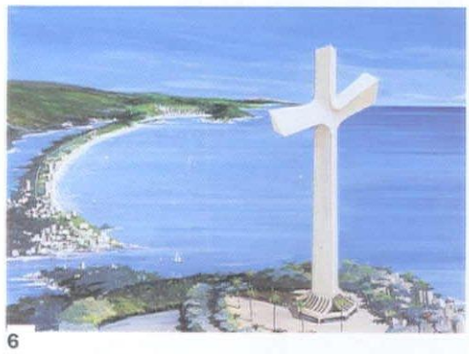

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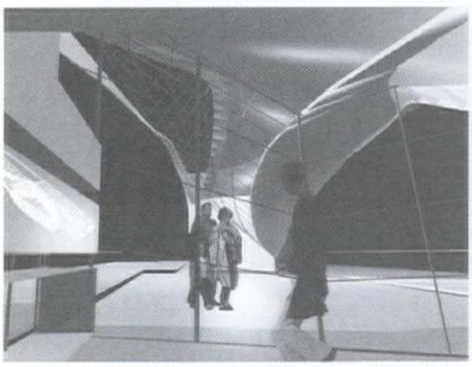
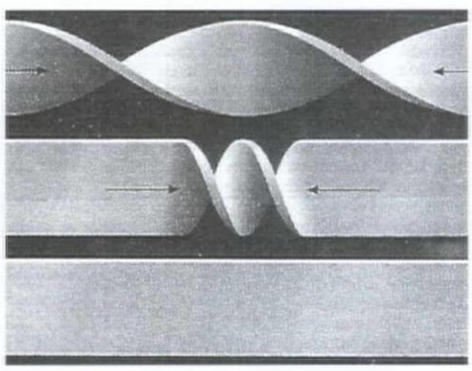
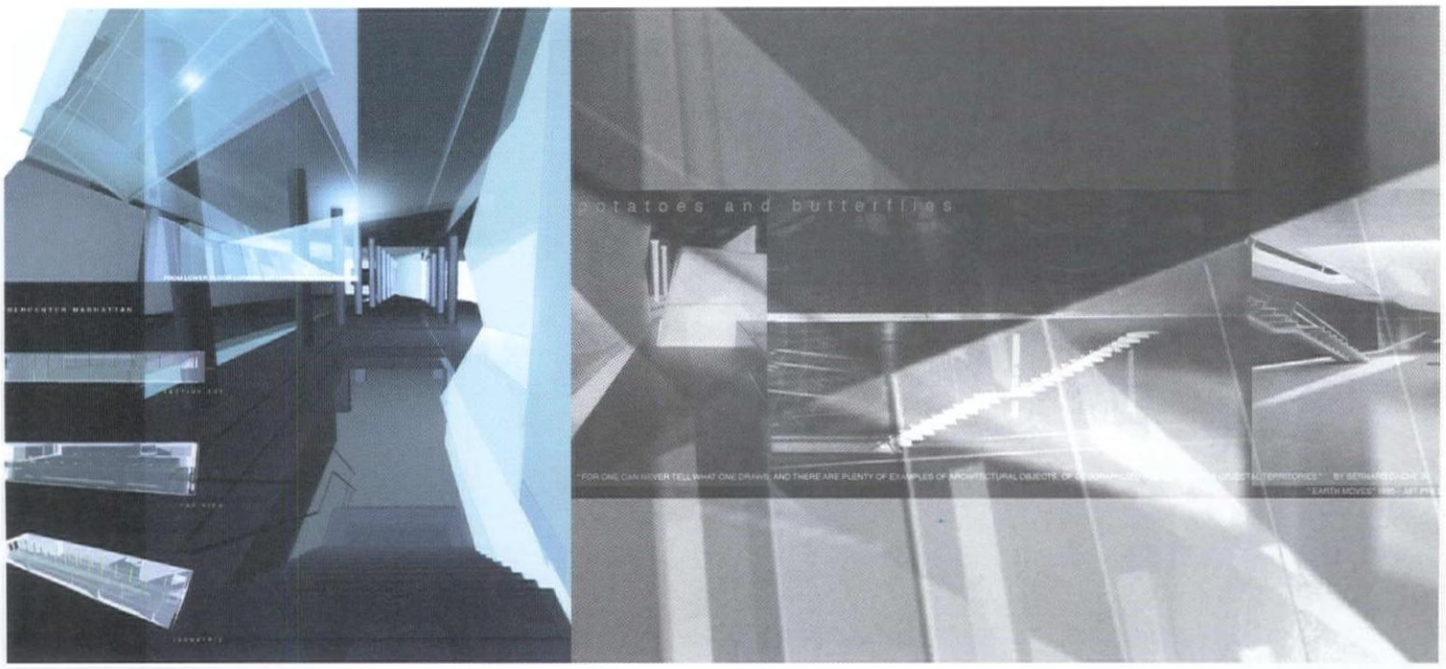
Trans-formal architecture

The conditions of ideological vacuum in architecture draws to the centre of the professional debate concepts and tasks originated at its periphery – the zone of interdisciplinary mixture and overlapping. Experimentation on the borderline with other disciplines catalyses more hopes for philosophical adequacy and conceptual strength for architecture during the last years of the millennium. Winka Dubbledam, architect and sculptor from the computer oriented generation, argues in this interview with Georgi Stanishev, that architecture must be accelerated by introducing conceptions from its margin fields, its borderlines with biology, computer sciences, mathematics and modern physics.





DIS-A-PIER: project for the Yokohama Port Terminal Design Competition, 1994.
The notion of delay is introduced in a topological model of the project where two twisted rubber bands distill this time-lapse in the space of the terminal. In the science of topology the twisted rubber band illustrates the unwinding and eventual disappearance of a texture. This notion of instability and temporality illustrates the fluidity of time and space. The two twisted surfaces have separate programs: one is the carrier of city functions, the other of terminal functions. The intersection of the two bands results in a series of functional modules which will simultaneously connect and slip past each other. Their volume comprises the 48,000 square metres required. The fluidity of the terminal structure is determined by the interaction of the mathematical geometry of the computer virtual space and the material resistance factor of the physical model

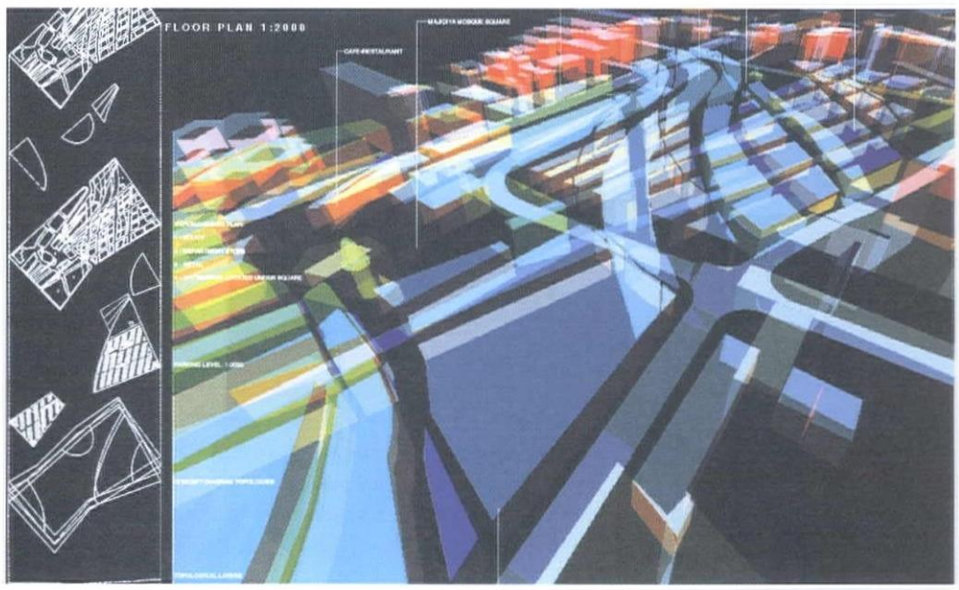


Georgi Stanishev: What is the central concept in what you are doing in architecture?
Winka Dubbledam: The common denominator for my projects is that they are conceived and developed as textures; textures that are formed of interweaving layers representing spatial, political, social, economic and cultural influences. The notion of texture represents a dynamic system where layers connect and inform each other in a complex matrix, replacing the two-dimensional grid. The introduction of this concept in our spatial experience of architecture will result in a space consisting of a series of dynamic frames, of shifting horizons, changing the common notions of elements like the wall, the door, the facade, etc.

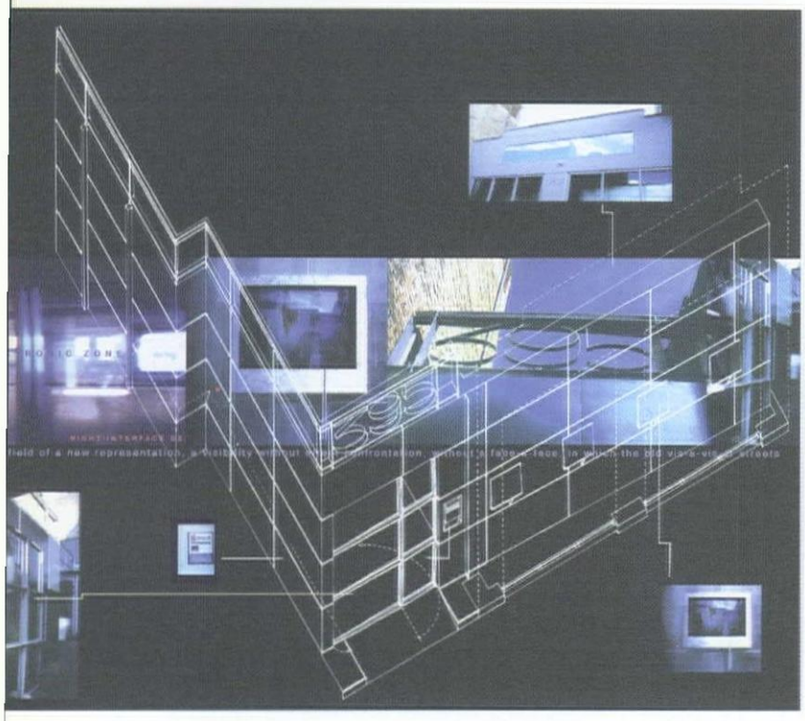
Could you describe the new typologies that you hope to develop?
They are typologies that are more related to different textures of spatial reality than to species. Thus "Urban Textures" is an investigation of the field-condition, where new urban solids are fragmented by traces of history, by speed vectors, or layers of new economies. Architectural textures are related to the changing meaning of the "facade" or the "wall". They have been of major influence on the development of the building volume. The property of a "smart" surface containing new information has transformed the wall from a singular object into a membrane, an information surface. Finally the "Virtual Textures" relate to the constant flow of communication and new media. These communication networks change the importance of location or site of the built structure. Buildings can thus be located anywhere in this global matrix: in the desert ("Biological Research Centre") or underground in the metropolis ("Cyber Centre Manhattan"); they are thus no longer concerned with a representation of power but rather form "nodes" in the global network of information systems.

Your artistic origins are in sculpture. How does the sculptural vision influence your architectural projects?
I studied sculpture before architecture but in my mind both disciplines are inseparable and intertwine in every project I do. For example the design of the "WaterWork Installation" conceptually representing floating urban fragments in space, was simultaneously the working model for my urban project for Dordrecht. In Yokohama the basic sculptural premise was the investigation of the topological defects; the twisted rubber bands. These two bands were both the carrier of functional programs: a city-band and a terminal-band. The project started from this scientific notion, was then built as a physical sculptural model

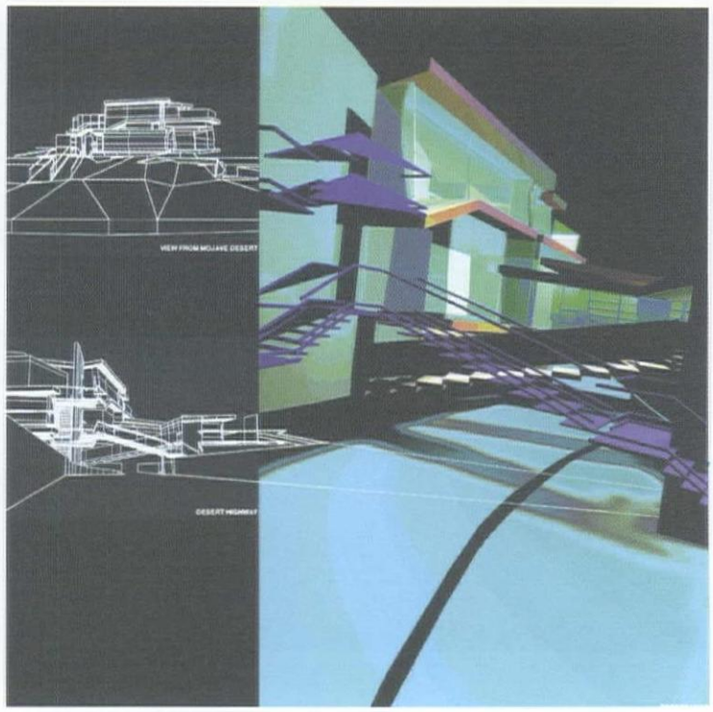
Above: Cyber Center in the New York City, 1995
The New Media Center will be located in Soho, NYC, occupying two floors of 7,500 square feet each in an existing landmark building, and will contain: Cyber-cafe, Imaging center, Mixed-Media gallery, UDA classrooms, auditorium, exhibition spaces and offices. The insertion of this mostly "mental space" into the existing building structure posits that subtraction will precede addition. The completely gutted space will enable minimal gestures with a strong spatial effect, reminding of an urban landscape rather than an interior. The suggestion of the infinite space is borrowed from the electronic communication space regulated by the matrix in an endless spatial modelling process. Where the mind travels these infinite planes of cyberspace, the body occupies a "modelled" space of comfort provided by a smart environment with adjustable light conditions and climate-controlled spaces



Above: 2d-4bx, Beirut Excavated Project, 1994.
Beirut, located at the foot of a mountain finds its historical data recorded in the folded layers of the underground, on geological, cultural and political levels.
Originally the city centre was located on the waterfront, the harbor for trade. With the recent developments of land-reclamation and the introduction of a business district, the new city centre has been relocated. The re-installation of the traditional historical souks, the market places, seems contradictory with the idea of large modern functions as department stores, cinemas and parking lots, but the process is programmed as a weaving of different functions in one fluid urban structure



Above: Cristinerose: A Mixed-Media Art Gallery, New York City, 1994.
The concept was to restore the existing stone structure to its original symmetry and to intersect it with a new steel structure – a zone of electronic communication. The steel wall contains four surveillance monitors directed towards the street. The passer-by is confronted with these monitors connected to cameras placed inside the gallery: both the exhibit and its visitors are framed by the monitors. They create a zone of instability and reversal: one is no longer sure who is viewing whom. Once the visitor has moved inside the gallery the situation is reversed; one becomes part of the exhibit



Above: A Biological Research Center, Mojave Desert, 1994.
This center focuses on the study of the land turtle, in danger of extinction, which has an almost mystical importance in many cultures. The ancient Chinese sign of the turtle is the "Magic Square" – the first mathematical expression of the Pythagorean Theorem. Hence it seemed interesting to implement this theorem by representing it through a set of twisting squares around an open centre, a proportional system for the concept of field. The structure exists of four topological plates twisting out of the desert surface

of two twisted intersecting bands and the material resistance of this model was plotted in the computer by registering each x, y, z coordinate. So, more than just a mathematical expression it represented the energy and tension of the twisted intersection.

You are known as a highly computerised architect. How does the computer influence our notion of space?

The investigation of these new systems in science could not have happened without the introduction of the computer, a tool which can register complex mechanisms and simulate their spatial consequences. Here the matrix is the measuring device rather than the two dimensional grid represented in Euclidean geometry. For example in physics the matrix is used to define "phase space", a description of points notated in space overtime, a dynamic system. In geology the use of Land Sat and Sea Sat systems notate precise satellite measurements which are digitised by computer and visualised in three dimensional imaging processes. They have enabled us to map remote and uncharted parts of the world. The computer enabled the scientist to visualise these complex phenomena and therefore to understand, investigate, and develop them.

And in architecture? Do you consider the computer a mere sophisticated drawing instrument, or is it for you something more – a media that catalyses innovative decisions in the design process?

The computer is for me both a sculpting tool and a conceptual inspiration. The challenge to investigate this new "mental" space forces one to look at more speculative operations. The theoretical issues mentioned above lead to spatial complexities which can only be investigated with the help of the computer matrix. But more than its technical qualities it inspires one to contemplate the new electronic communication space. In our projects the computer also becomes a constructive ingredient of the environment. In the Electronic Media Center in Manhattan we studied the transformation of SUR-face into INTER-face, the introduction of an infinite space in the built environment. For example in the design of the Cristinerose Gallery on West Broadway, we inverted the notion of electronic surveillance; the monitors show the gallery space, with viewers, inside to the passer-by on the street. One is no longer sure; viewing or being viewed? Or becoming what will be seen?

Does that mean that there are radically new requirements to what is considered as contemporary architecture emerging?

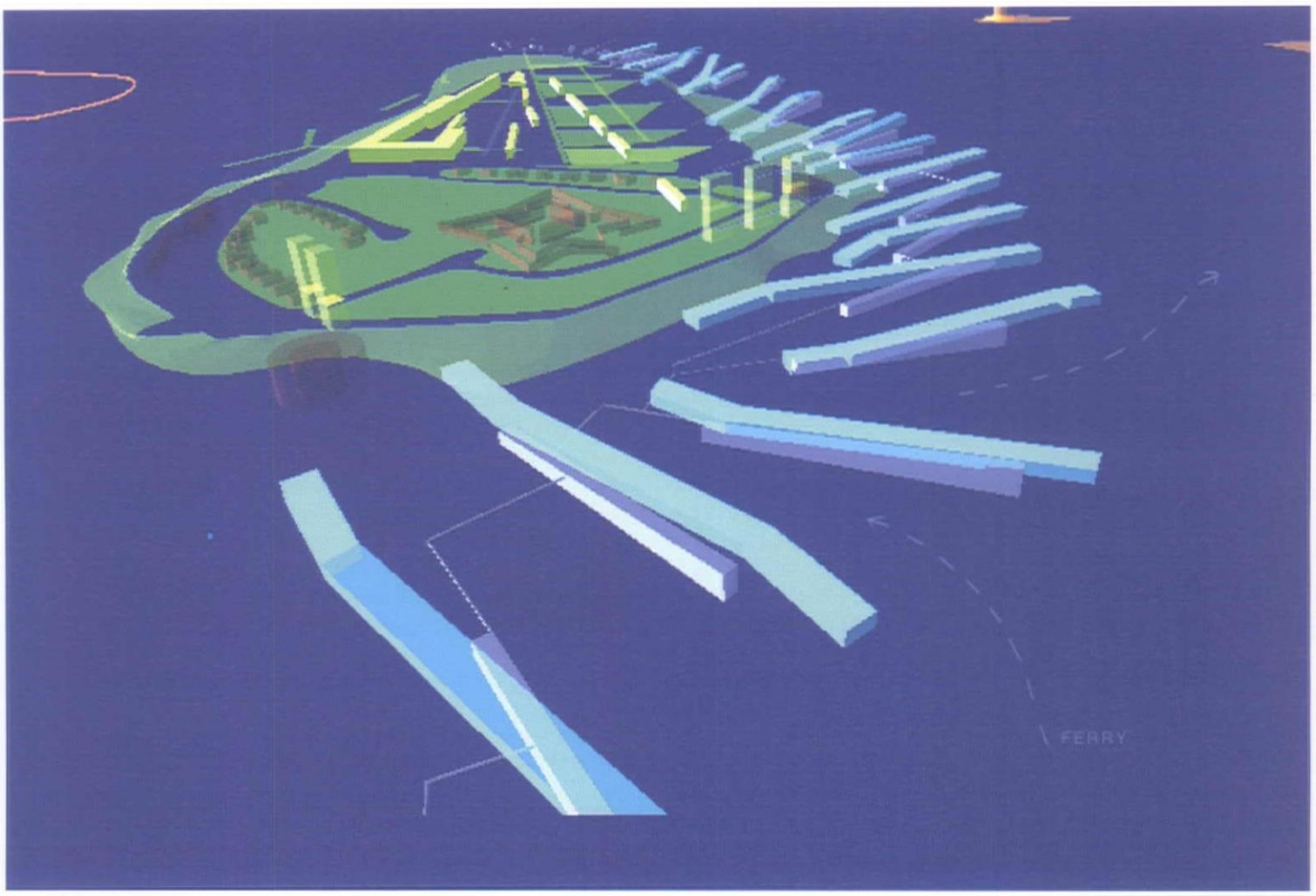
Yes, what is required are dynamic architectural systems which can adapt themselves to changing circumstances, the equivalent of a "trans-formal" space, a space which has "overcome" form and is in constant flux. Here we are concerned with the investigation of a fluid space reacting like an organism, a self-regulating, re-active space.

What changes are happening in the architectural profession as a consequence of these new conceptions?

The architectural profession, confronted with the complex manifestations of our society, can no longer limit itself to craftsmanship, proportional systems, or aesthetics. The consequences for the possible architectural developments could be investigated by tracing parallel meanings with other sciences. The act of comparing is a method commonly employed in science. For example, cybernetics introduces physics and psychology for the comparative study of "control" systems represented both in the brain and the nervous system as well as in the mechanical or computerised information and control systems. For architecture the study of science, philosophy, mathematics or micro-physics, could become of extreme importance, since they offer new ways to develop architectural solutions, to problems raised by new infrastructures, new economics and new sites.

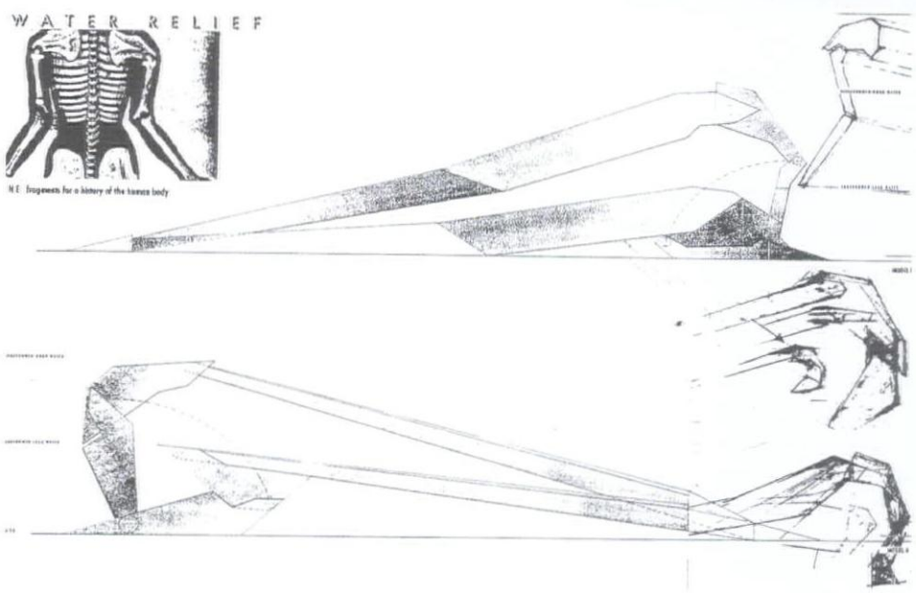
Then can it be said that the periphery of the architectural profession, its borderlines with other disciplines, are the productive areas, the zones where things happen?

My main interest lies exactly in investigating



Above: MANATVS – Temporal Territories: Project for the Governor's Island Competition, 1996

The inherent memory of the island constitutes a permanently unstable entity, an ever fluctuating form and evolving structure. The introduction of pier-structures on the west side of the island will cause a gradual settlement of sand particles along that boundary, and the growth of a naturally protected beach. These piers will also provide the foundations for future housing structures, temporal dwellings. The artificially reclaimed sector of the island will contain services for the new apartment structures

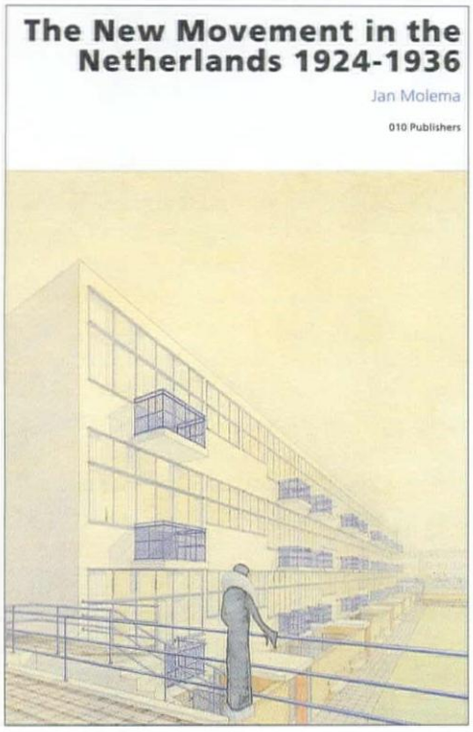


these "borderlines". One of the most influential people in this process for me has been Gilles Deleuze, especially his writings on the "Rhizome" where he describes a system consisting of multiple heterogeneous layers, without a fixed beginning or end; the energy is in the middle. Considering the fact that architecture could, or should, be a multiple heterogeneous system, the comparison with other sciences like physics, mathematics and philosophy could play an important role in the further development of architecture. Being embedded in history, architecture could be accelerated into future developments only by the introduction of the new notions of fluidity, continuity and complexity. What is in the focus of these investigations is not the innovation of architectural language, but the new dynamic system of spatial realities, a Trans-Formal Architecture. **WA**

Above: Water Relief: A study/installation for the restructuring of the Dutch river cities, 1995

The Water Work project was the consequence of recurring floods in Dutch river cities. The urban landscape proposed for Dordrecht consists of a series of sloping surfaces with mobile segments inserted – the unstable landscape, and infrastructure knots. For normal water levels they are positioned in a folded, low state; as the water rises, they are able to un-fold, adjusting seamlessly to the stable segments in the landscape. The stable segments form urban recreation zones where rollerbladers, skateboarders, fishermen and sunbathers will find excitement and relaxation

Books



LOWLANDS LET DOWN

The New Movement in the Netherlands 1924-36. *Jan Molema. 010 Publishers. 160pp, fully illustrated. £18.50*

Reviewed by Peter Wislocki

Citing the *Penguin English Dictionary* in an attempt to define "modern" is the kind of tactic adopted by first year students of (at best) average ability, yet it is not beneath Jan Molema, an author whose intelligence and grasp of his subject cannot so easily be questioned. Molema's book is obsessed with definitions, classifications and categorisations – a work of historiography more than simple history, written by historians for historians.

The format is conventional: a "key-note" essay by Molema, supported by three shorter, more narrowly focused texts, providing a context for illustrations of the work of 22 architects. Maristell Casciato's *Notes on the Historiography of Modernism* sets the scene, discussing some of the ideological concerns which emerged from the Bauhaus, through Gropius' Internationale Architekur forming the basis of the Netherlands' Neues Bauen. Molema's *The rational, the functional, the poetic* revisits the same broad subject in a more passionate and polemical spirit. Both authors note gaps between theory and practice exhibited by their subjects. Casciato talks of Duiker's "dissolving of artistry in the engineer's mind" (a phrase which might have suffered in translation); whilst Molema's more straightforward conclusion is that "these theoretical purists are actually subtle, ingenious architects, plastic artists whose words conceal a passion for a beautiful architecture".

The 22 purists and artists given individual chapters each receive a brief, mainly biographical introduction, followed by between two and 18 pages of drawings and black and white photographs of selected buildings and projects. Johannes Duiker is given the most extensive coverage; whilst Rietveld is included as one of the designers of undisputed historical significance who nevertheless appear peripheral to the book's principal themes.

Two further essays complete the study *Berlage in America* by Christopher Vernon and an *Introduction to the catalogue Americana* by Leonard Eaton reinforces the book's academic credentials with well researched but hardly rousing studies.

THE MAKING OF A CLASSIC

The Idea of the City. *Edited by Robin Middleton. Architectural Association. 238pp. £24.95*

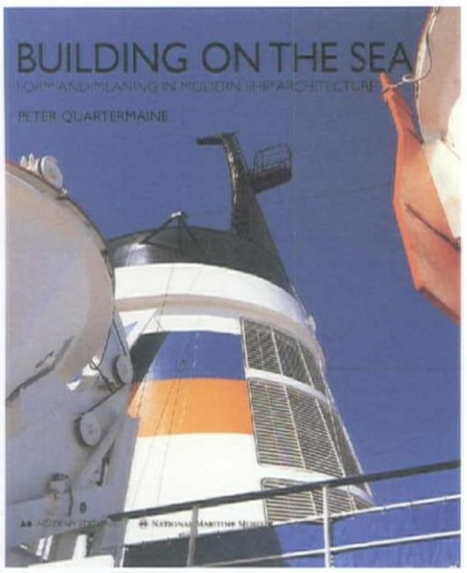
Reviewed by Martin Pawley

Long ago, in the spring of 1971, Alvin Boyarsky won an election to become chairman of the Architectural Association school of architecture in London. His opponents in the election were Kenneth Frampton and "No Chairman" – an anarchic alternative dreamed up by the "Special Committee of staff and students" that had ruled the school ever since the previous chairman, under the influence of a mysterious religious sect, had changed his name, announced the forthcoming closure of the school, and resigned.

Surviving members of the AA "Special Committee" will remember Boyarsky's first staff meeting after his seizure of power. Entering the room he made his way to the table around which the staff were seated, and where two chairs had been left for him to choose from. He picked one up and moved it to one side, then sat down on the other at the head of the table and said; "Let's start the way we mean to go on."

Alvin Boyarsky did go on. He survived as chairman from 1971 until his death in 1990 and, during that time, he utterly transformed the AA from a stick-in-the-mud Association that ran an English school of architecture with excellent London connections, into a megabucks global school of architecture that ran rings round the dwindling Association that was supposed to be running it. During Boyarsky's reign (and reign is the right word for it), the school shed its rundown public school image and became glitteringly cosmopolitan. It became an internationally important lecture venue, an incubator of radical talent, an exhibition space and finally an architectural publishing house. Yet 19 years later, when Boyarsky died, this school rejected his heritage and his proteges. Everything he had gambled for against horrendous odds was thrown away. His successor was a safe pair of hands who lasted barely two years.

This modest volume is an attempt to square accounts with the legacy of Alvin Boyarsky. It is the kind of *Festschrift* that some contributors abuse by publishing their own work in the pretence that it was inspired by him; others write from a genuinely fond remembrance, and the whole is wrapped in a thematic editorial pretence – in this case that it is about the nature of the city – the subject of an AA symposium dedicated to his memory. There are essays and articles, long and short, by the editor, John Hejduk, Peter Eisenman, Rem Koolhaas, Zaha Hadid, Daniel Libeskind, Peter Wilson, Dalibor Vesely, Ben Nicholson, Bernard Tschumi, Nigel Coates, Leon van Schaik, Raoul Bunschoten, Chris Macdonald, Peter Salter, Peter Cook and Boyarsky himself. Sadly none of them strays from the conventional to explore the financial and political genius of this strange and restless man, a prototype of today's booming genre of architectural administrators.



FLOATING INSPIRATIONS

Building on the Sea. *By Peter Quartermaine. Academy Editions. 128pp. £29.95*

Reviewed by Tracey McKeown

This is a wonderfully timely book, spoiled a little by the curiously off-putting tone adopted by its author – who praises Sir Keith Joseph, Margaret Thatcher and the Falklands War in his acknowledgments – but wonderful for all that. As its title implies, it explores the design world of modern ships, many of which are of course amazingly specialised, ruthlessly functional in their appearance, and almost entirely ignored by the land-based design press. Quartermaine is fishing in rich waters here because the relationship between ship design and building design goes back a long way, at least as far as the transposition of wooden hulls into roofs in the middle ages, and deck beams into railway lines later on. The connection has however all but disappeared since the eclipse of the modern movement. Back in the 1920s ships were the inspiration of Le Corbusier, an architect who, with staggering directness, took their canopied superstructures for his elevations (along with the interplane struts of biplane aircraft as his pilotis) and made from such functional ingredients a whole new architecture. Unfortunately what Quartermaine tries to do in *Building on the Sea* is the reverse. Instead of writing a didactic book about how the uncluttered functionalism of modern ships has – externally at least – more or less resisted the cancer of post-modernism and remained available as the inspiration for a new burst of functionalist architecture, he invades the wonderful world of ship design with a cargo of quotations and post-modern architectural terminology. The result is rather like the memorable introduction to Umberto Eco – "Saab-driving Italian professor of semiotics" – offered by *Saab Magazine*. What is wrong with it is obvious. The important thing about Umberto Eco is not that he drives a Saab: nor is the important thing about the design of ships the fact that you can wax erudite by using quotations from architects to discuss it. In *Building on the Sea* the result is a fascinating series of chapter headings – "Form, meaning and the maritime post-modern" is typical – that turn out to be arch and repetitive texts that are hard to persevere with. Try this for example; "Accepting illustrations as integral to a book's intention requires awareness of the relationship between the visual image and the printed word, a field of communication explored by Charles Ivens Jr, and Estelle Jussim." Well yes, but "accepting illustrations" has been explored by a few thousand other people too, and many of them have demonstrated their understanding of it by using a little less hard-to-read sans-serif text, and a little more attention to lucid caption-writing.

That much being said, there is a mass of insight and information crammed into the modest 128 pages of *Building on the Sea* and, even more obviously, some phenomenally original picture research, both archival and contemporary. The result is a deeply fascinating piece of work. Hard to read and oddly disappointing it might be, but it is the best offbeat browse since Rudofsky's *Architecture without Architects.*

BOOKS RECEIVED

Desiring Practices: Architecture, Gender and the Interdisciplinary. *Edited by Duncan McCorquodale, Katerina Rüedi and Sarah Wigglesworth. Black Dog Publishing. 300pp, 60 b/w illustrations. £15.00 (paperback)*

Frank Lloyd Wright: Designs for an American Landscape 1922-32. *Edited by David G De Long. Thames and Hudson. 207pp, 86 b/w illustrations and 93 full colour plates. £36.00 (hardback)*

Bridges: Three Thousand Years of Defying Nature. *David J Brown. Mitchell Beazley. 176pp, fully colour illustrated throughout. £19.99 (hardback)*

Living Bridges. *Edited by Peter Murray and Mary Anne Stevens. Prestel. 192pp, 220 illustrations, 70 colour. £35 (hardback)*

Hyperwest: Amercian Residential Architecture on the Edge. *Alan Hess, photography by Alan Weintraub. Thames and Hudson. 176pp, 220 colour illustrations. £29.95 (hardback)*

Miami Trends and Traditions. *Text by Beth Dunlop, photography by Roberto Schezen. The Monacelli Press. 240pp, 169 colour illustrations. £40.00 (hardback)*

Colourscape. *Michael Lancaster. Academy Group. 128pp, illustrated throughout. £21.95 (paperback)*

The Alvar Aalto Guide. *Michael Trencher. Princton Architectural Press. 228pp, 200 b/w illustrations. £16.95 (paperback)*

East European Modernism: Architecture in Czechoslovakia, Hungary and Poland between the Wars. *Edited by Wojciech Lesnikowski. Thames and Hudson. 304pp, 240 illustrations. £29.95 (hardback)*

Tensile Architecture in the Urban Context. *Keith Boxer, Rudi Scheuermann. Butterworth Heinemann. 220pp, 139 line drawings. £45 (hardback)*

Beirut Reborn: the Restoration and Development of the Central District. *Angus Gavin and Ramez Maluf. Academy Group. 148pp, 258 illustrations. £39.95 (hardback)*

The road that is not a road and the Open City, Ritoque, Chile. *Ann M Pendleton-Julian. MIT Press. 304pp, 134 illustrations. £14.95/US$17.50(paperback)*

Clare Design's Cotton Tree Housing development, can be seen as typical of recent Australian housing projects in its cost effectiveness and environmental sustainability.

Housing the world

The house is the first architectural sign of civilisation. The type varies according to climate and culture: from 24 hour corporate housing in Tokyo, Japan to the "sweat equity" social housing of downtown Santiago, Chile. Joshua Levine in Kuala Lumpur, Michael Rowe in Paris, David Cohn in Madrid, Oliver Hamn in Berlin and Judith Davidson in New York report on some of the distinctive international variations of this ubiquitous architectural type.

Asia Pacific

Australia

In Australia, the majority of housing developments can be divided into two groups, urban renovation/reclamation projects and clusters of low-rise medium-density suburban units. The gentrification of previously fringe and inner city derelict districts has led to projects like Housing Ultimo by Tonkin Zulairha and Roderick Simpson. These affordable housing units are designed to both fit well within the old city and be environmentally sensitive. Melbourne Postcode 3000, initiated by the local government and planned by the Victorian Department of Housing, is another popular urban redevelopment scheme at the scale of an entire postal area.

As the commercial market remains dormant, there has been a rise in the number of housing starts. The target market and financing for these projects has come mostly from Asian sources. Sydney, which has high expectations for the Olympic games, should lead the increase in housing projects.

The scale of fees for housing is respectable, but the amount of time necessary to realise the projects is high. The most lucrative projects, like those by the developer Meriton in Sydney, are influencing development in other urban areas.

Australian architects are privileging two design issues: environmental sustainabilty and cost effectiveness. Cotton Tree Housing, by Clare Design, is a recent award winning design which looks at the issues of the environment and private domain. This project incorporates such features as passive solar energy and natural ventilation in a carefully planned layout offering private and semi-private landscaped areas.

Malaysia

The two main housing developments in Malaysia are high-density service apartment blocks and new suburban townships. The number of service apartments in the downtown regions of the large cities has greatly increased as Malaysia becomes the hub of south-east Asian commuter business. The southern Malaysian border town of Johor Bahru will soon be linked to Singapore by an extension of Singapore's Light Rail Subway. This has led to the development of large tracts of detached and semi-detached residence units. In Kuala Lumpur, a similar phenomenon is taking effect as the development of new suburbs is activated in anticipation of the completion of Kuala Lumpur's subway lines.

Industrial and commercial developments are still strong and the housing market is not as significant a sector of the market as in neighbouring regions. Developers are privileging density, location and price over amenities, thus construction costs and fees are generally lower.

One notable project still under discussion is the Bukit Cahaya project near Shah Alam. The development is a new community of up-market bungalow tracts with the imagery of Beverley Hills. Proposals for the individual houses have been designed by Jimmy Lim (CSL Associates), Arthur Erickson, Itsuko Hasegawa and other internationally known architects.

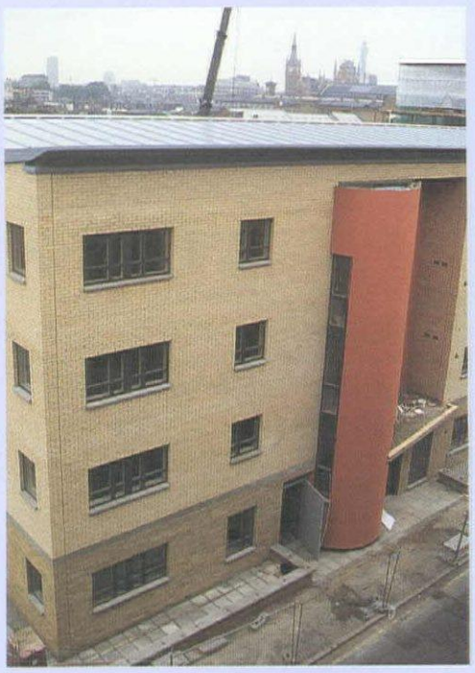
Hong Kong

The general increase in the quality of living conditions coupled with higher salary expectations has pushed the housing market from its mid-nineties lull to its currently healthy state. The concentration is in two areas: high-end housing and the development of new areas outside Hong Kong Island and Kowloon. The affluence and sophistication of the buyers is forcing developers to offer units with increased amenities and common facilities. The completion of the airport link rail is also expected to open up new territories for development. These rail stations will be linked to the commercial areas and become highly developed and attractive commuter locations.

Expensive units with extensive facilities means the architects are able to design with more generous budgets and collect good fees. Two notable projects are Tseung Kwan O by Anthony Ng, and the Laguna City development by Dennis Lau and Ng Chun Man Architects and Engineers Ltd. The Tsueng Kwan O project ventures into the area of green architecture and offers custom-made environmental features. Laguna City, which consists of 40 towers and 8,000 units, is a good example of the use of a prototypical floor plan which maximises both privacy and open space.

Canadian Riverside Village, Hamamatsu, Japan

Canadian architects Arc Design International recently completed a Canadian style neighbourhood of 23 homes in Japan, 11 of which sold in the first three hours after the opening. The homes are of wood frame construction, pre-panelled in British Columbia and exported to Japan for assembly. The three bedroom houses are 1,100 to 1,200 square feet and include tatami, living and dining rooms. Architect Farzin Yadegari claims that "The greatest challenges were to fit everything into such a small square footage and to keep respect for the Japanese lifestyle while incorporating a western look".



Killick Street Block, London, UK

Together with the Peabody trust, Avanti Architects are developing this site near London's Kings Cross as part of a plan to revitalise the area. Although built to a tight budget, imaginative shapes and colours are used to create attractive accommodation for families and individuals. Dickon Robinson of the Peabody Trust predicts a substantial growth in the number of people living in London. "The demand for housing in central London has always been strong from the poorer people as the number of homeless testifies. However, now, for the first time in many years, large numbers of middle and professional classes are moving back to inner London. It is boom time for private house builders." The shadow housing minister Nick Raynsford disagrees with Sir Richard Rogers who believes that the solution is high density housing, claiming that planners should recognise that many people want to live in houses with gardens.

Below left *Rive Gauche, Paris. One of very few major housing schemes to have been undertaken in France during recent years. The project aims to provide Paris with a new mixed-use district combining accommodation, shops, offices and recreational areas.* ***Below*** *James Joyce Square, part of the Rive Gauche development*

Europe

France

French architects looking for commissions from the country's housing sector need to be at least as skilled in battling with paradox and uncertainty as they are at designing buildings for living in.

First the government announced a zero interest loan scheme to help relaunch new house building and the languishing residential property markets. Now it wants to chop some FF13 billion off the national housing budget as part of efforts to reduce public deficits in line with the increasingly unpopular Maastricht criteria. At the same time, it is reluctantly bailing out a subsidised housing finance specialist called the CFF, which clocked up 1995 losses of FF10.4 billion following speculative property ventures.

Then ministers decided to separate architectural issues from the Ministry of Public Works which plays an important role in social sector housing provision and establish a special architectural directorate in the much less powerful Ministry of Culture. The lines of demarcation were established with such care that callers to either are now quite likely to be referred to the other and back again.

On top of all this, the government is currently reviewing the basic criteria for allocating subsidised housing to tenants with modest incomes and everyone is waiting for the new guidelines. The move coincides with a headline making scandal over public-sector housing practices in Paris.

Some major schemes are still going ahead, though often on a reduced scale because of continued depression in the housing markets and slow economic growth. One prominent example is the Paris Rive Gauche development, which aims at providing the city with a totally new mixed-use district combining flats, shops, offices and recreational areas.

At the same time, France's 1,000 or so housing associations are struggling with the new environment. Currently, these provide accommodation for around 13 million tenants in a total of some 3.4 million residential units. Many of the associations are now devoting a growing part of their efforts to the renovation of older premises in line with renewed interest in neighbourhood life in the cities.

Spain

Decent housing is a constitutional right in Spain's 17 year old democracy, but price increases in the late 1980s have placed housing out of reach of first-time buyers: in Madrid, children do not leave home on average until the age of 30, and the median apartment costs eight times the annual salary of a young working couple. The resulting crisis, together with the soft office market and lowering interest rates, has created a boom in housing construction promoted by massive state aid.

The region of Madrid for example has authorised the construction of 500,000 units over the next 20 years, serving a population increase of only 500,000 with 300,000 units in the 1996-2008 General Plan of the city alone. Local authorities urbanise vacant land, specifying the number of subsidised units required (generally half) for qualifying buyers with incomes at two and a half – to three and a half times the minimum wage. Besides parks, schools and other services, each municipality has ceded 10 percent of the buildable space for its own use, generally dedicated to housing for the indigent. For qualifying buyers, the central government also subsidises low-interest mortgages, over 100,000 nation-wide per year.

Typical of these developments is Madrid Sur, finished in 1994, with 4,385 units, all subsidised and organised by builder's and worker's unions in co-operative owners' associations. The development succeeds a shanty town rehoused in the famous Paolmeras housing for the 1970s nearby. Its nostalgic patio-block buildings and regular street grid, designed by A Vázquez de Castro, provide the model for similar developments across the country, although newer trends combine row houses and end-block towers in longer blocks, as seen in Equipo Auia's Loranca underway outside Madrid.

Development plans are generally municipal, but architects such as MBM and Ricardo Bofill

Below *Hans Kollhoff's condensed block structure in Berlin-Wilmersdorf. Designed with the requirements of the professional urban dweller in mind (either single people, or couples without children) the emphasis is placed on privacy.* ***Below right*** *Rüdiger Kramm's row housing in Frankfurt-Bonames. Comprised of five rows, the open spaces in between encourage a sense of communal living, a feeling enhanced by the flexibility of the structure neighbouring flats can be either joined or divided depending on the needs of the habitants*

(both Barcelona) or Equipo Auia and Manuel Ayllón in Madrid are leading specialists. The architects associated with the best housing (generally public) are synonymous with the best names given the importance of the field, including M De las Casas, M Bayón (Madrid), G Vázquez Consuegra, Cruz & Ortiz (Sevilla), Torres & Martínez Lapeña, C Ferrater, O Tusquets, J Llinás (Barcelona), etc.

Germany

Over the last decade, there has been a spectacular "rise and fall" in the German residential sector, influenced by the reunification process in 1989/90, and its consequences: a massive investment in east Germany, both in private single-family housing, and in housing estates financed by private investors, companies or co-operatives. The possibility of reducing income taxes by about 50 percent of the total building costs to investors caused a boom in the residential sector (felt even more explicitly in office building).

West Germany, too, profited from the economical upswing at the end of the 1980s: the rate of building permissions in the housing market rose between 1987 and 1994 from 190,700 to 586,500 units, but in 1995, it fell down to 458,700 units, as a consequence of the new economic crisis. In east Germany, the end of the boom is also in sight: in December the 50 percent deduction programme will terminate, causing a dramatic drop in housing construction. More than 700,000 units throughout Germany are forecast for completion during 1996, is a huge task which is probably out of reach.

The stagnation or drop in disposable incomes and the high demand for flats in cities, and for single-family or terraced houses on the periphery, results in a rising need for "cost and surface-saving building systems". Dutch, Scandinavian and US pre fab-housing systems are increasingly pressing for a market share. German building contractors and architects neglected the development of the mass-produced elements for too long although in recent years, some experiments have been undertaken. For example "timber system construction" for apartments in Bavaria, where 900 units in 20 communities, in three-storey structures have been built at a cost of less than 1,800 DM per square metre pure building costs (that is more than 20 percent under standard in Germany, taking into consideration that the overall costs in agglomerations rise up to more than 5000 DM/square metres).

In terms of the architecture of Germany's housing two examples from the most influential German cities on the international architectural scene during the 1920s, and which seem to have regained their significance in the 1980s and 1990s, are Frankfurt and Berlin. The two projects represent two contrasting building types: row housing on the periphery, and a high-condensed block structure within an agglomeration respectively, but also two different design views: the progressive south German "school of Behnisch" (principle: "layers") and the more conservative, Berlin-like "critical reconstruction". As a result, both Rüdiger Kramm's five rows in Frankfurt-Bonames and Hans Kollhoff's block in Berlin-Wilmersdorf, offer flexibly usable rooms and strong contrasts between the wide-open main facade, and the nearly closed facade along the circulation side. But while Kramm's housing estate offers the possibility of unifying two neighbouring flats or separating a larger one into two, should the household grow or shrink ("optional living"), Kollhoff's block of flats is "for singles and dinkies

Heerstrasse/Nennhauser Damm

This residential development in Spandau, Germany is being developed by the Lincoln Property Company, the largest real estate developer both in Germany and the US. The scheme was designed by HOK. Lincoln propose to build public recreation space and provide access to "Am Rain" street enabling the project to be developed in an optimal manner.

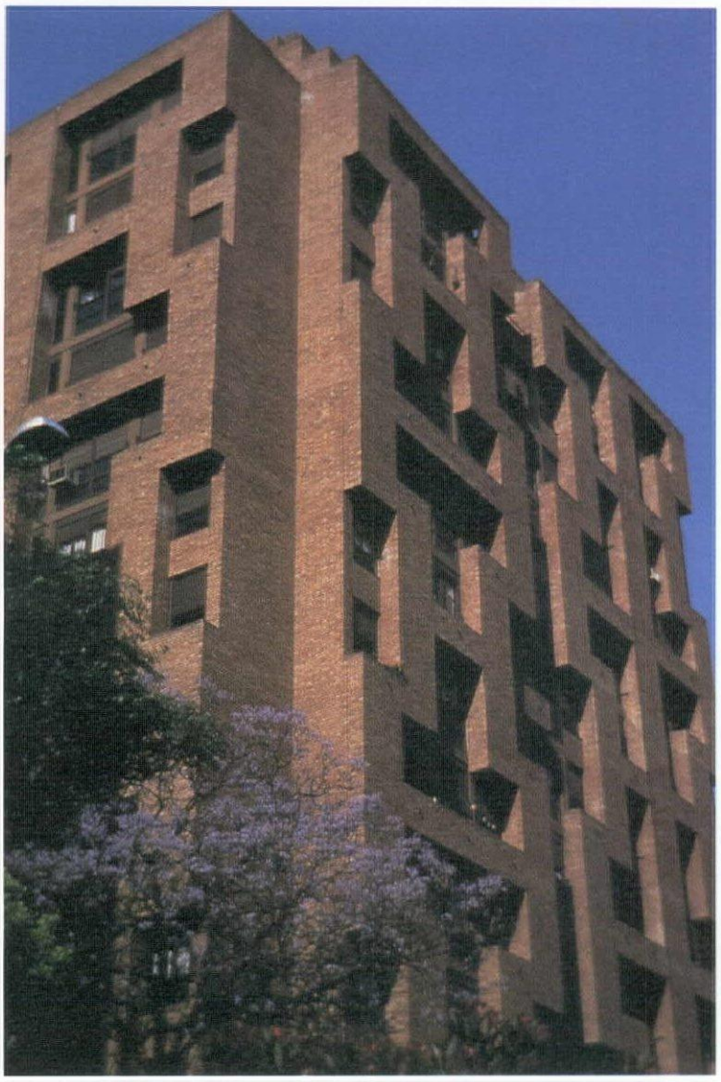
Colsubsidio Citadel, Bogotá

Sterile and anonymous projects traditionally seem to characterise Latin American suburbia, especially when dealing with large projects for low and middle income groups. That is not the case with the Colsubsidio Citadel, one of the largest and most ambitious housing projects being developed in Bogotá by German Samper. When complete, it will house 12,000 dwellings, combining both single houses and apartments. Its initial phase, completed in 1995, had 6,000 units and community services.

The project itself has specific historic references, and reflects nostalgic values and images of what a city was and what it can still be in the midst of modern demands. Plazas, smaller squares, green areas and streets favour pedestrians over vehicles; sectors are linked by means of slightly curved walkways that allow for permanent changes of perspectives and views; the combination of houses and buildings provides variety and a frame of reference.

Traditional construction systems were used, as opposed to sophisticated prefabricated alternatives, keeping the final cost suprisingly low. This was due not only to the size of the project, but also because of the extreme rationality of the architectural and technical designs.

Below *The Zigurat housing development, Cordoba, Argentina by Togo Diaz. With over 20 years experience in residential construction Diaz' work aims to achieve a new urban identity, through both materials used, and form.* ***Below right top*** *Arc Design International's 33 unit condominium complex, Langley, Canada.* ***Bottom right*** *Group of 17 residential units, Santa Monica, California by Arc Design International – architect for both projects H Amanat*



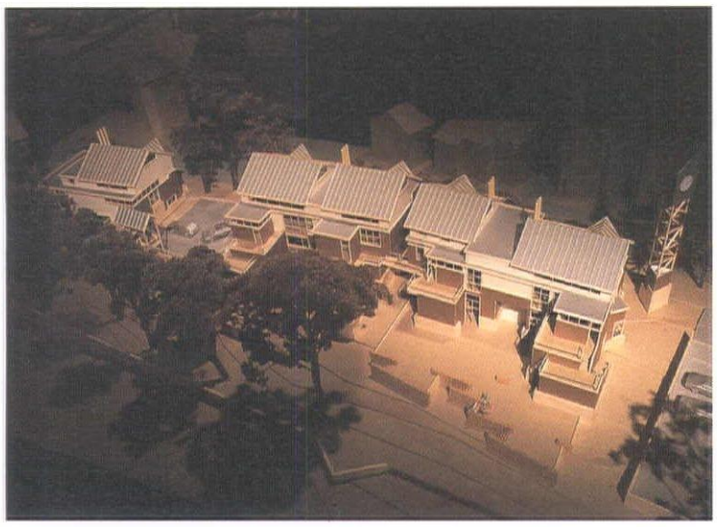
[double income no kids] only". The function of staircases and winter gardens in the two cities are opposite. In the Frankfurt suburb they are semi-public places, with more emphasis on the outside than those in the Berlin development. In the latter the stairs and gardens face the regional train; they are private zones. In this respect the two schemes represent totally different ways of living, although both are typical of modern German cities.

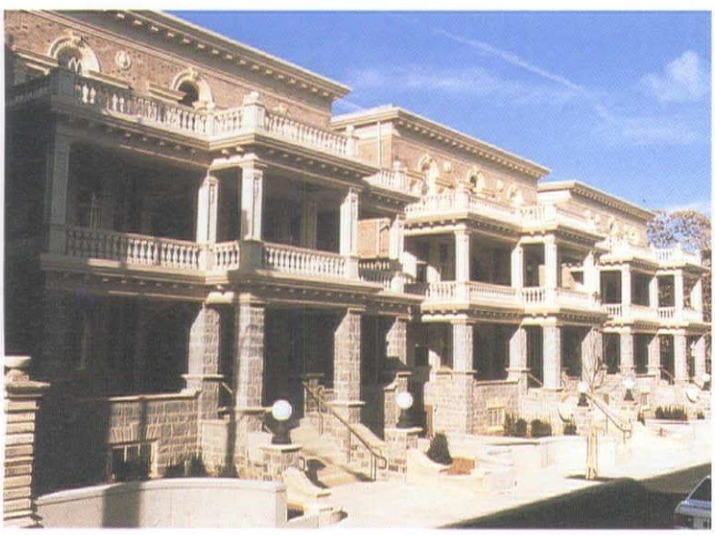
United States of America

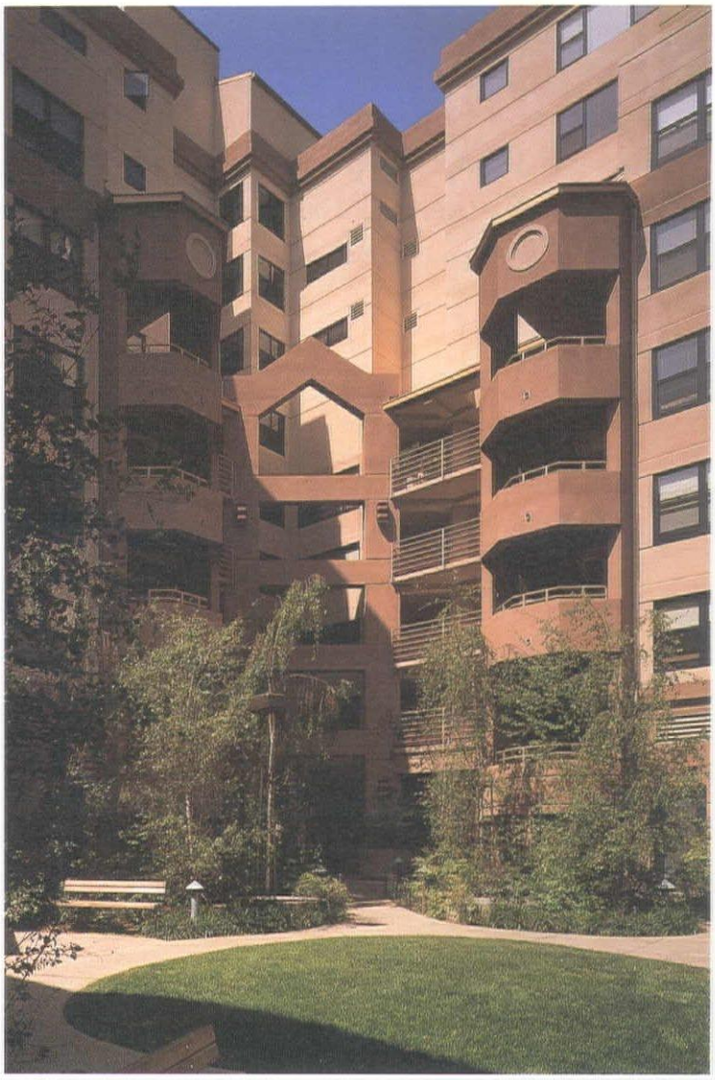
Call it affordable housing, low-income housing or social housing, production in the US is about half the rate of a decade ago. Last year only 278,000 units became available at prices suited to the 20 million households earning less than half the median wage and paying up to 50 percent of income on often substandard housing. A 1996 American Institute of Architects resolution states, "the rapid decline in the provision of affordable housing has been largely ignored ... 25 percent of our population cannot afford unsubsidised housing." Public housing projects, which shelter approximately 30 percent of the nation's needy and have waiting lists of up to 12 years, are knocked down or blown up regularly in Pittsburgh, Baltimore, Newark and, in Atlanta, the nation's first project whose site is slated for private development. "In many cases the maintenance was awful," says AIA vice president Richard Bradfield, "but they could have been fixed. We've thrown the baby out with the bath water." Despite the adverse climate, however, architects, local governments and local community groups have been producing a slow but steady stream of low-rent units designed not just as shelter but also as community stabilisers, showing more aesthetic intent than affordable housing has in some time. Architects committed to this building type consider themselves well paid, even when complicated financing and intense work with end users are taken into account.

At 778-unit Passyunk Homes in Philadelphia, built in 1941 as temporary Navy housing, Kelly/Maiello conducted numerous meetings to discover what tenant leaders, teenagers and the elderly wanted; immediate priorities became new roofs, a community centre and a medical centre. "When no work has been done

Below left top *Jan Wampler has incorporated "sweat equity" and flexibility in his 12-unit project for artists in Boston, USA.* ***Below left bottom*** *Kelly/ Maiello's 80-unit Regent Terrace, has become a model for community stabilisation through housing renewal in the USA.* ***Below*** *Hardison Komatsu Ivelich & Tucker's Courtyard, San Fransisco is typical of the practice's work in the city, with tightly packed units in a small area. HKIT use as much glass as possible in order to maximise the number of "eyes" on the street. Local police have found that this helps to reduce criminal activity*







for decades," says Emanuel Kelly, "they need to see some immediate results." Recent television coverage of Kelly/Maiello's 80-unit Regent Terrace, a model for community stabilisation through housing renewal, shows the development to be as pristine as the day it opened.

Realistic upgrades – three or more bedrooms, adequate storage, private entrances for security, private baths and kitchenettes in single occupancy rooms (SRO) – prevent one-to-one unit replacement, as do required social service spaces when Federal money or service-oriented sponsors are involved. Other building types, however, are being converted to housing: Close Associates' social services centre and 11 housing units in a former fur-coat factory in St Paul, Minnesota, and Peter L Woll and Beth Cooper Lawrence 123 SRO units in an abandoned New York hospital are examples.

New construction adopts a tightly packed new urbanism of town houses with secured out-door encounter spaces and a maximum number of windows, or "eyes" on public streets, a pattern police departments say reduces crime. Hardison Komatsu Ivelich & Tucker designed 51 town houses with pitched roofs and winding paths on top of a garage in San Francisco and 62 units tucked into a few large suburban-residence envelopes next to a historic district in Berkeley. At the Tenderloin in San Francisco, designed for 238 households, some of whom had been living seven to a room, HKIT analysed the city's past successes and failures and concluded that clusters of 20 to 40 units with separate elevator lobbies provide a sense of individual investment in the property and the greatest control over a large population of children.

Jan Wampler, professor of architecture at MIT, has incorporated "sweat equity" and adaptable spaces into 12-units of artists' housing for Boston. "We can't afford a bank's idea of a complete sellable house anymore," Wampler says. Double height unfinished spaces contain plumbing, heating and electrical connections, and can be configured into separate levels and rooms as the residents' lives evolve. Wampler believes in employing old materials and local suppliers, imaginative use of cheap components, mutual "barn-raising" assistance and bartering, – such as a standing-seam metal roof for a weekend in Boston for the roofers' families. **WA**

Housing
Hanscomb Associates

On an international level, trends in residential housing defy definition. Although a major sector of any nation's construction industry, local culture dictates all – location, scale and form. Hanscomb Associates make sense of a highly personal building type.

Residential construction

Residential construction, typically a major sector in any country's construction industry, may account for between 30 and 50 percent of total construction output, new construction and repair. The single family house remains a major factor in this market, although multi-family residential is an important market segment. Considering that the estimated world-wide value of construction output is in excess of US$2 trillion, the millions of housing projects required to generate this output is astounding.

Another major residential classification is private versus public sector housing. Since government policies determine the extent of public involvement in direct construction of housing, its importance varies among countries. For example, public sector housing may be less than 5 percent of the residential market in the US, whereas in the UK, it may be as high as 15 percent. In many countries, since the public sector provides low-cost housing, either by direct construction or subsidy, private residential developers often confine themselves to middle and upper income bracket housing.

Cultural characteristics

Housing is an excellent example of a building type highly influenced by local culture. Perhaps this is because it is a very personal building type. Architectural style, equipment, room type and size are predicated on cultural norms. Consider the typical construction materials for a standard quality single family house in various countries shown in *Table 1*. The construction shown may be typical for other countries in the region, but architectural styles are likely to change.

Cultural influences are numerous and they are more than just external style. Consider the following:

- **Mobility of the population** The US population is very mobile. About 10 percent of the population moves each year. In contrast to the masonry and concrete structures of Germany, the typical US construction appears flimsy.
- **Outdoor living space** is an integral part of houses in many cultures. It is traditionally an integral part of South American and Mediterranean homes.
- **Extended family living** is common, two master bedroom are not unusual: A Japanese house will typically have both "Western" and Japanese style (tatami rooms, paper doors and screens) rooms.
- **Car garages** Double (or even triple) garages are common in the US and Canada, whereas in less well developed countries covered carports are still the norm.

Case study – Singapore

- The building code prescribes that every occupiable space must have operable windows. They use natural ventilation, not mechanical air-conditioning, resulting in greater exterior wall space.
- Building insulation is uncommon.
- There is a preference for brick and plaster walls since solidity connotes higher quality.
- It is customary for the kitchen to have an outside service area because of traditional cooking methods.

Case study – Jakarta

- There is less regulation of the building environment than in Singapore, so high-rise apartments are more "Westernised".
- More land is available than in Singapore, therefore high-rise living is relatively new.
- Condominium ownership is still a novelty.
- Traffic congestion is one factor bringing people back into the city to live in high-rise buildings.

Information provided by Chuck Hall of Smallwood, Reynolds, Steward & Associates.

Neil Veitch, of Lincoln Properties GmbH, notes that the political and regulatory environment, a result of cultural attitudes, contribute to design and cost differences. The main elements affecting costs in Germany, compared to other European locations, are the strict structural, thermal and acoustic requirements throughout the building. As a result of environmental pressure many developments require "green" or grassed roofs increasing structural costs.

Configuration and cost

Housing costs are sensitive to the preferences in room sizes, number of rooms, amenities, and architectural styles. Social policy, personal living styles and aspirations are a few of the factors driving local preferences.

- **China** until new development brought about the rebuilding of housing high-density housing cost about US$100 per square metre, but this included communal kitchens and toilets, basic finishes, single elevator, rudimentary heating and lighting, cheap facades, but not landscaping.

Building costs by square metre – individual dwelling

- *Bathrooms* are typically a high cost room because of plumbing and finishes. The number of bathrooms is an important factor. A high ratio of bathroom area to total area will tend to increase square metre costs. The number of fixtures in bathrooms is a contributing factor both from additional space and the fixture cost itself. So fixture density (square metres per fixture) is one measure of costs.
- *Kitchens* are another high cost room. Developers generally provide cabinets, countertops and sinks in apartments. In Germany, tenants often move their kitchens with them –

Table 1 – Typical Construction Materials for a Detached, Single Family House

	Germany	UK	USA	Argentina	Australia	Japan
Structural system	Concrete frame with masonry in-fill	Wood frame	Wood frame	Concrete frame with masonry in-fill	Wood frame	Wood frame
Exterior wall finish	Stucco	Brick veneer	Brick veneer, wood siding or stucco	Stucco, brick veneer, tile or stone	Brick veneer or stucco	Stucco or cement siding
Roofing	Clay or cement tiles	Clay tiles	Fibreglass shingles	Concrete slab	Concrete tiles	Clay tiles, cement slate
Interior partitions	Masonry with plaster finish or plasterboard	Wood stud with plasterboard	Wood stud with plasterboard	Masonry with plaster finish	Wood stud with plasterboard	Wood stud with plasterboard
HVAC	Central heat, no air conditioning	Central heat no air conditioning	Central heat and air conditioning	Central heat, no air conditioning	Central heat, no air conditioning	Central heat and air conditioning
Cost per square metre	DM 1,600-1,800	£575-650	US$550-700	n/a	A$525-650	¥130,000-180,000

Table 2 – Apartment Building Cost Comparison

	Cost per square metre (in US$)
India, Malaysia, Thailand	Less than $400
Canada, Mexico	$400 to $500
Czech Republic, Indonesia, Spain	$500 50 $600
Hungary, Portugal	$600 to $700
Belgium, Ireland, USA	$700 to $800
Australia, Greece, Netherlands, New Zealand, South Korea	$800 to $900
Great Britain, Italy, Poland, Singapore	$900 to $1,000
France, Hong Kong, Sweden	$1,000 to $1,100
Denmark	$1,100 to $1,200
Germany	$1,300 to $1,400
Japan, Switzerland	Greater than $1,400

hence German domination of high class kitchen manufacturing. However, appliances are not provided in all countries. The costs for France, Greece, Ireland, and Thailand did not include kitchen appliances. Jim Davidson of Schuman, Lichtenstein, Clamon, Efron in New York City cites the high costs of bathroom and kitchen areas as a reason why developers build fewer studios now.

- *Size of the apartment* will affect the square metre cost, but its influence is greater on the dwelling cost. The number and size of rooms will vary square metre costs. Smaller or fewer rooms may result in higher square metre costs, at least for the interior construction, finishes and services. Smaller rooms may result in a higher partition density. Larger dwellings will reduce the impact of higher cost bathrooms and kitchens on the square metre cost.
- *Internal layout of the apartment* Michael Bennet of HOK in Berlin notes that apartment configurations are very different to those in North America. All rooms are accessible by a main corridor. There are no interconnecting rooms.
- *Quality of finishes* obviously influences cost. However, a more basic question may be level of finishes provided.

Construction unit prices per building

- Number of stories, size and perimeter configuration.
- Resident parking capacity and how it is provided. Enclosed underground parking in congested urban areas can add considerably to the cost per dwelling.
- The use of mechanical air conditioning. If it is provided, is there a central system or individual units?
- Extent and type of balconies provided.
- Extent of amenity areas included.
- Sophistication of security and communications systems used, if any.
- Level of quality of interior finishes. As finish quality increases, there is a tendency to increase public areas in size and quality.
- Pro-forma and marketability of the units drive the look and feel of the building. Construction costs must fit the pro-forma, while the amenities and design features must attract the potential buyers or renters. For example, most developers in New York City want to spend an appropriate amount on the exterior. Masonry, traditional exteriors are the norm.

Case study – Regulatory influences impacting high-rise residential design in the US

- Handicapped accessibility criteria require larger foyers, wider corridors and larger bathrooms. Often, this additional space leaves bedrooms and living rooms smaller, in order to maintain cost levels.
- Seismic code changes may have less impact on high-rise than low-rise construction, but the additional costs are a consideration.
- Zoning tends to dictate type and shape of building and location tends to dictate size of units.

Information provided by Jim Davidson of Schman Lichtenstein Claimon, Efron in New York.

Case study – US/Japan apartment cost

- A Japanese apartment built in San Francisco would probably not cost much more. However, a US design built in San Francisco would probably cost 30 to 40 percent less. A couple of design related reasons are:
  - Japanese apartments are very small. A studio in Japan might be 30 square metres, while it might be 50 square metres in San Francisco.
  - Constricted sites are the norm in Japan so designs have a small footprint. This increases structural and exterior wall costs. To enclose such a small footprint requires about one square metre of exterior wall surface for every square metre of floor area. The usual ratio in the US rarely exceeds 0.5 square metres per square foot.

Information provided by Brian Bowen of Hanscomb.

Cost comparisons

The accompanying table indicates approximate costs of apartment buildings in various locations using square metre price ranges. The costs reflect local design. Some points to consider are:

- The costs for Ireland and the Netherlands do not include floor finishes.
- Air conditioning is a common amenity in North America, but not in Europe, Asia or South America.
- Our survey suggested two bedroom apartment units as a standard for comparison. Exceptions include Mexico (3) and Thailand (1).
- One bathroom is the most common. However, Mexico and the US have two bathrooms.
- Costs for the US and Mexico include a sprinkler system as part of the building fire protection.
- The costs reported did not include window treatment (blinds and curtains), except for Sweden, Thailand and the US.

In addition, the unit costs are subject to all the usual vagaries: codes, regulations, climatic and site factors etc. The comparisons represent a suburban location at city perimeter and exclude land, demolition, site work, management and design fees, financing, other soft costs and Value Added Tax. **WA**

Corporation housing
Tokyo, Japan

Architect Toshio Akimoto
Photographs Eiji Yonekura

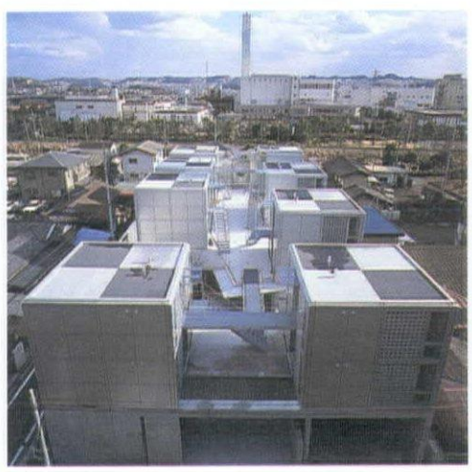
Left *Toshio Akimoto's design for the Yakult dormitory project was dictated by two guiding principles: the lifestyle of the inhabiitants (single employees), and the nature of the Yakult Corporation's work ethic (necessitating employee flexibility in order to maximise production).* ***Below*** *The overhead view shows how the eight cubes were set into the site, lending a sense of rational order to an otherwise poorly articulated urban district.* ***Opposite page*** *Set on two levels, the project has two distinct characters. The design of the upper level seeks to promote an air of domesticity, hence the strictly de-lineated forms and explicitly visible private stair-cases*

The very specific concept of personal space and privacy balanced against the Japanese attitude to work and company loyalty has been encapsulated in the Yakult dormitory. Toshio Akimoto was chosen from over 800 entries in a public competition sponsored by the Yakult Corporation, for designs for a company housing facility for single employees.

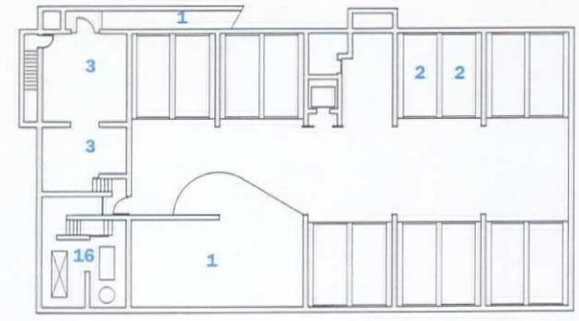
Akimoto has worked in housing since 1989 when he was awarded the Kawaguchi City Urban Design Award. A year later he won a competition to design housing for the Sumitomo Metal Mine company and last year he was awarded the prestigous Tokyo Housing Architecture Prize.

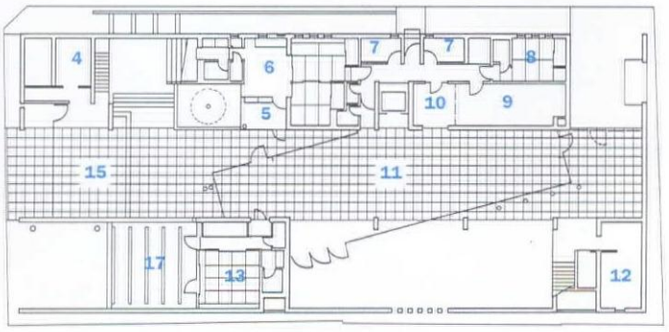
The Yakult scheme takes into account the company's own particular system of working, involving a flexible timetable for the workers which guarantees production around the clock. The functional solution has been achieved with great simplicity, it is based around eight cubes of six square meters which have been set in the site, each cube housing four units.

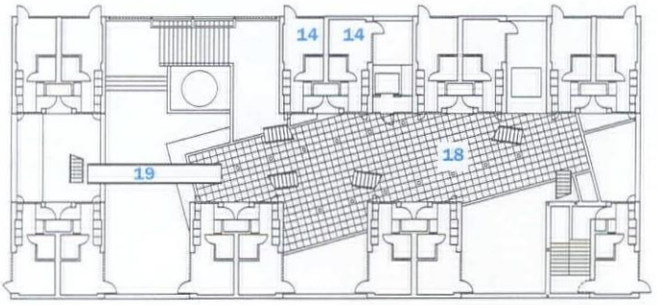
The private rooms function like independent houses, each linked directly to the city. The cubes are bound together by an open deck on the second floor and designed for ease of access to the common hall and guest room. The apartments occupy the upper levels faced with a combination of pavisade and alminium

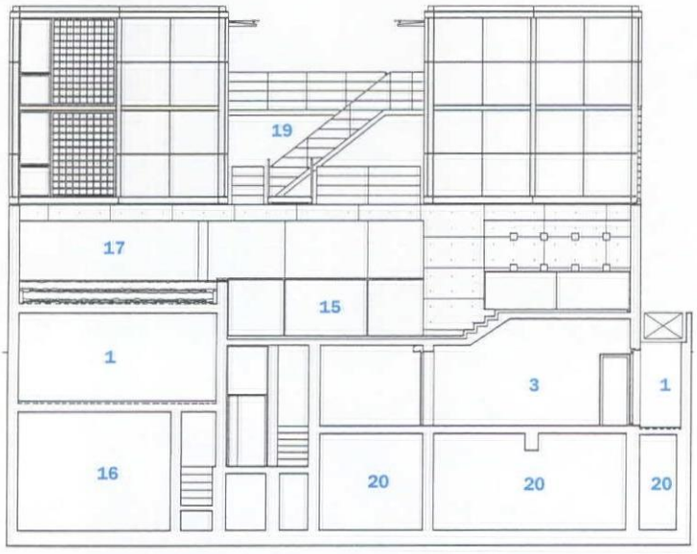


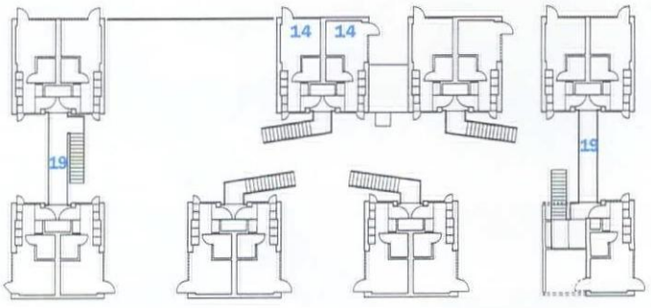
Above *The cubes are bound together by an open deck, facilitating access to the public areas on the ground floor*







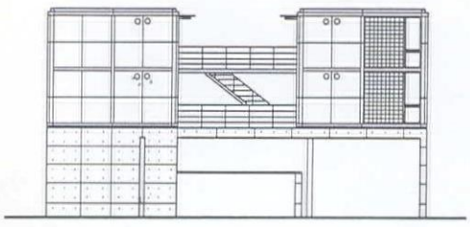


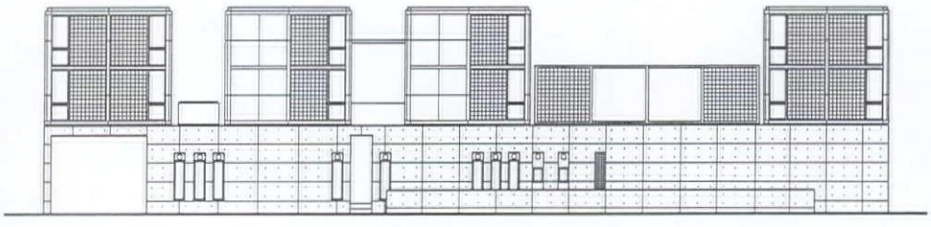


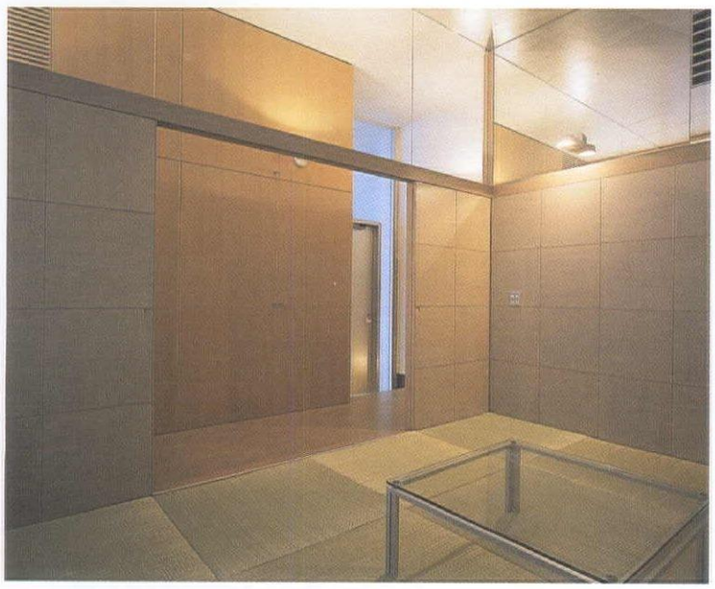
Key - Plans and section

1 Ramp
2 Parking space
3 Bicycle parking
4 Mail delivery
5 Administration office
6 Caretaker's room
7 Ante-room
8 Cooks' room
9 Kitchen
10 Pantry
11 Hall
12 Laundry
13 Guest room
14 Dormitory room
15 Entrance
16 Water tanks
17 Light court
18 Deck
19 Bridge
20 Pit

Above from top *Basement plan; ground floor plan; first floor plan; second floor plan.* ***Above left*** *Section showing detail below dormitory blocks.* ***Below*** *Elevations*







Left *The night-time shot of the upper level demonstrates the design intention of privacy within a unified whole.* ***Bottom left*** *View of domestic interior. The rational, cuboid forms of the exterior are echoed in the flexible and conspicuously spartan interior.* ***Below*** *General facilities (kitchen, laundry, office etc) are located on the ground level, with the intention of creating a sense of urban space within which residents might interact.* ***Bottom right*** *Night-time shot of the ground level*

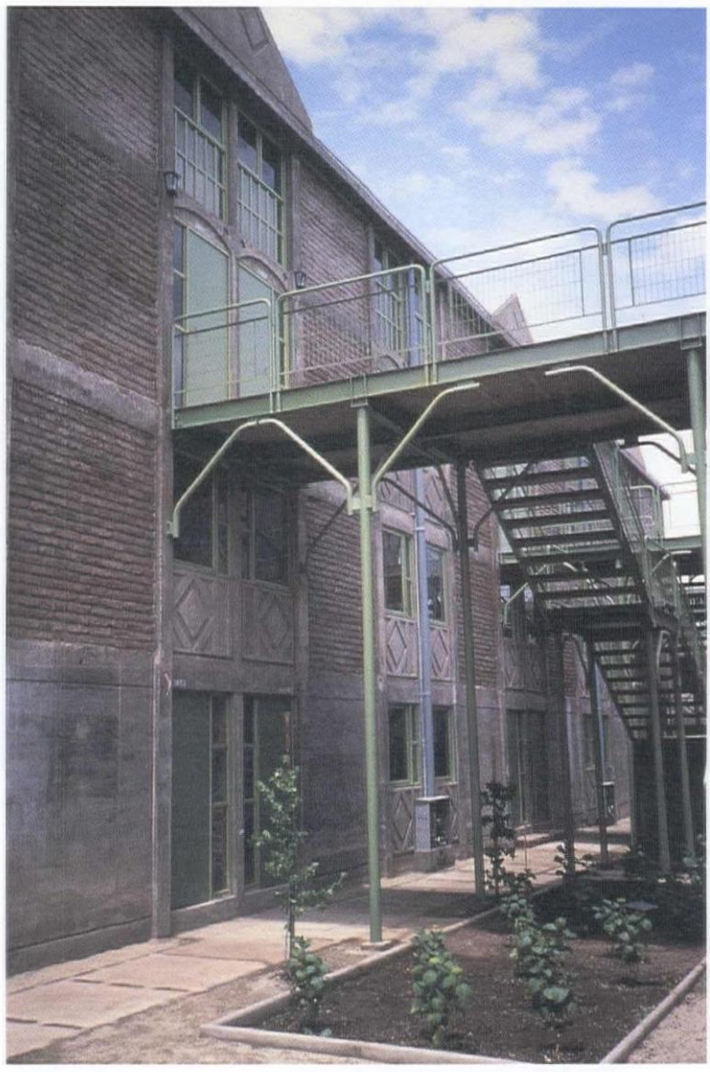
plate while the general facilities (kitchen, laundry, office, the manager's rooms and a small bedroom for guests) are located on the ground floor, shared out between two buildings. In contrast to this grouping of private rooms, the ground floor has more of the character of urban space.

The project has two distinct characters: the domestic feel created on the upper floor and a more urban atmosphere where the lower floor is open to interact with the rest of Hachioji life. The theme was to dissolve the building type called the single's dormitory and to discover, in the relationship between individual spaces, the collective dwelling and the city, a way of dwelling collectively that ensures a comfortable living space for the individual: single dormitory cubes collected together to form a streetscape. The visual effect created by the articulation of the cubes succeeds in harmonising the ill-defined townscape of the surrounding area. **WA**

Architect	Toshio Akimoto
Client	Yakult Honsha Co. Ltd.
Structural Engineer	TIS & Partners Co. Ltd./ Imagawa Norihide. Hirokazu in
Mechanical Engineer	Sankyo Setubi Sekkei Co. Ltd./ Yatsuo Masaike
Electrical Engineer	Yamazaki Setsubi Sekkei Co. Ltd./ Shouichi Yamazaki
Building Contractor	The Furukawa Ryngyo Co. Ltd.

The Andalucia Housing Community
Santiago, Chile

Architect Fernando Castillo
Text Carlos Morales



In 1993, Fernando Castillo was selected to design the Andalucia Housing Community in Chile which won the prestigious "Gran Premio" in the 1995 Architectural Biennale in Chile. Don Fernando has acquired an international reputation for progressive development projects where the residents provide the labour to build, or at least to complete, their own homes. This "self-build" alternative to low-cost housing has influenced a better quality of community housing all over Latin America.

Besides being a skillful architect, Don Fernando is a national, political and academic personality, well known as former rector of the Universidad Catolica de Chile and mayor of Santiago. His private firm was one of the largest and most successful in Chile but gradually he gravitated towards community architecture. Now his firm is small and modest, but still busy and he is admired as a leader in the field of low cost housing.

Spain's relationship with Latin America became the focus of diplomatic, political and economic efforts during Felipe Gonzalez's presidency. As part of that interest, the government of Andalucia in Spain voted to sponsor community projects ranging from restoration of architectural heritage in Ecuador, to reconstruction of important urban sectors in Havana and housing in Santiago, Chile.

The Andalucia project is located close to the centre of Santiago. Formerly a middle-class "barrio", the area deteriorated leading to the subdivision of houses and finally to "family-per-room" situations. Inspite of this "barrio life" continued and Don Fernando recognised its potential for a "progressive development" housing scheme.

The project, which has a 250-inhabitants-per-acre density, emphasises the preservation of the urban image: two and three storey dwellings, continuous street facades, small workshops and informal recreational areas. With only three entrances, a small city is reproduced in its interior. Circulation takes place along a network of wide paths with private paths leading to each house. These reproduce urban streets and act as meeting places ensuring safety and a certain degree of privacy. Construction materials are simple: exposed brick is used on the interior and exterior combined with prefabricated concrete elements.

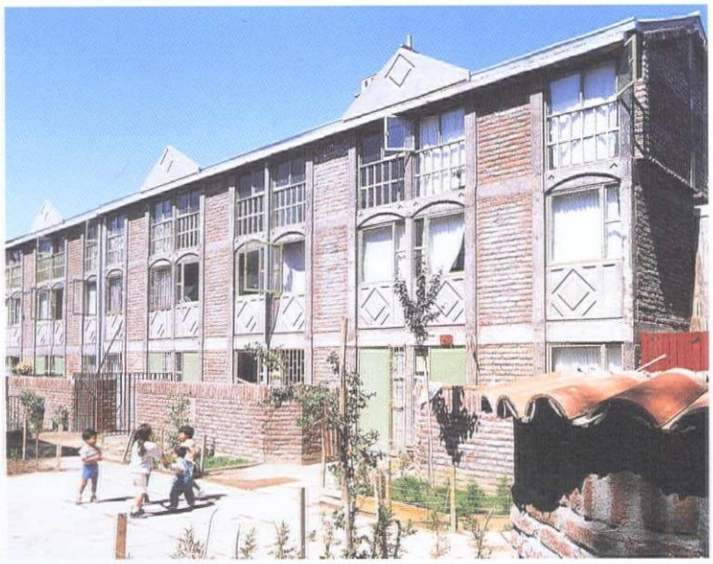
The first 180 units were handed over as single, empty interior spaces, two or three storeys high, which Don Fernando calls a "shell" for the residents to build on. These units were 30 square metres in the first level, consisting of a large space plus kitchen and bathroom. Over the following months, all residents were subsidised and encouraged to complete their homes according to their own needs and aspirations.

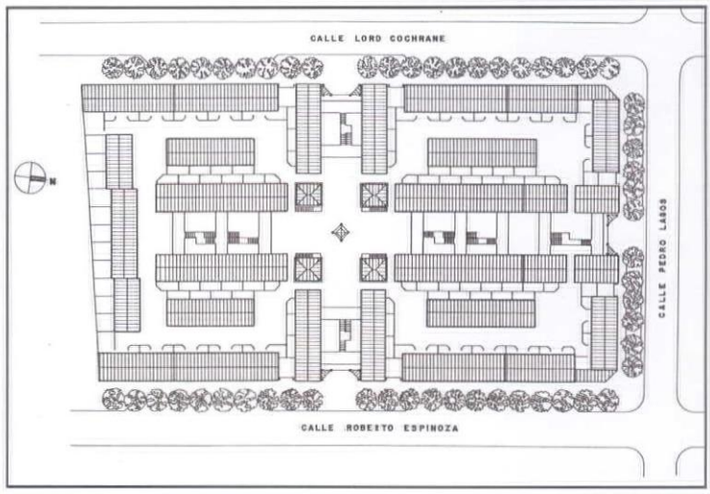
Several lessons can be learned from this project: firstly that coherent masterplanning precludes the chaos traditionally associated with "self build" schemes and secondly, that it is possible to increase density without creating overcrowding problems.

Of particular importance is the fact that residents can contribute what they have to offer: their work. Most projects demand from them what they lack: money. In this case, public financing and the work provided by each family, to conclude the construction, result in modest but dignified homes within a stimulating environment. With a little skill and a certain amount of common sense, the design can generate welcoming and exemplary communities. WA

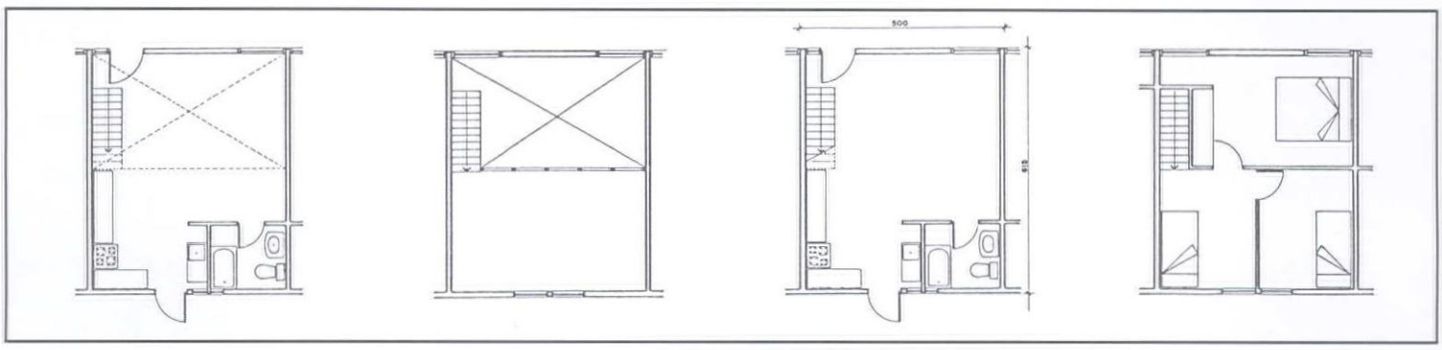
Carlos Morales is a specialist on contemporary Latin American architecture living in Colombia.

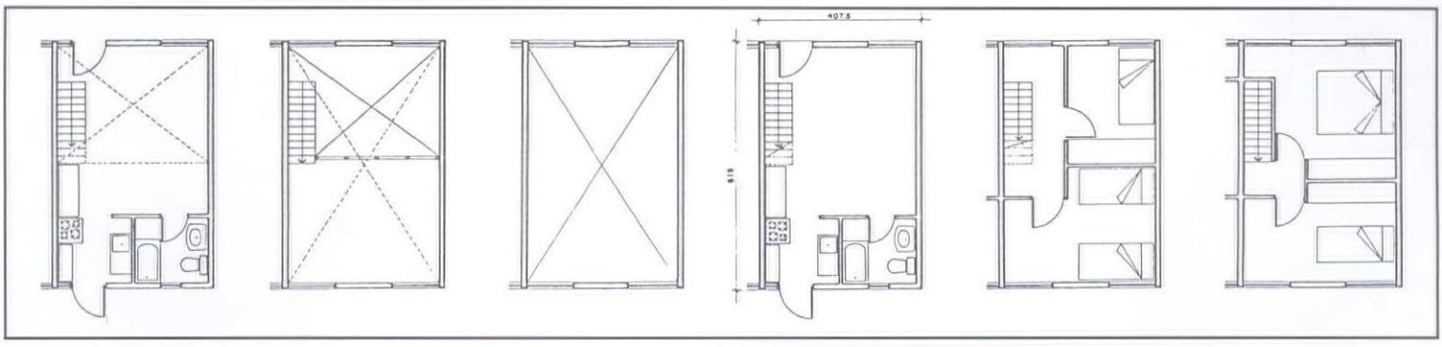
Architect	Fernando Castillo
Project	Andalucia Housing Community
Client	Serviu Metropolitano Housing Cooperative
Structural Engineer	Ernesto Herbach
Contractors	Elias Roitburd





Opposite *The linking raised walkways provide another level of "street life".* ***Clockwise from top left*** *Castillo's use of brick stems from his time teaching at Cambridge in the late 70s where he was impressed by the warmth and human scale of brick; ariel shot showing the self-contained barrio in its suburban context; site plan; Urban squares have created to encourage "barrio" community activities.* ***Below*** *Floor plans of two "shell" house types A and B*





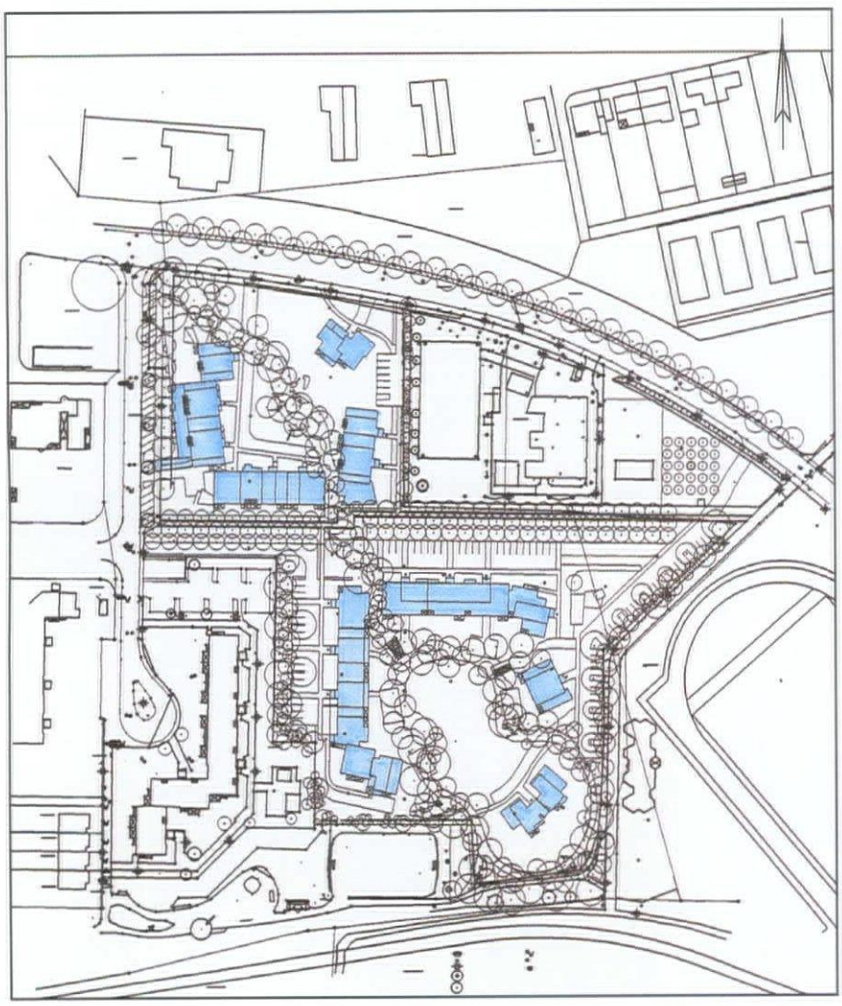
Social housing

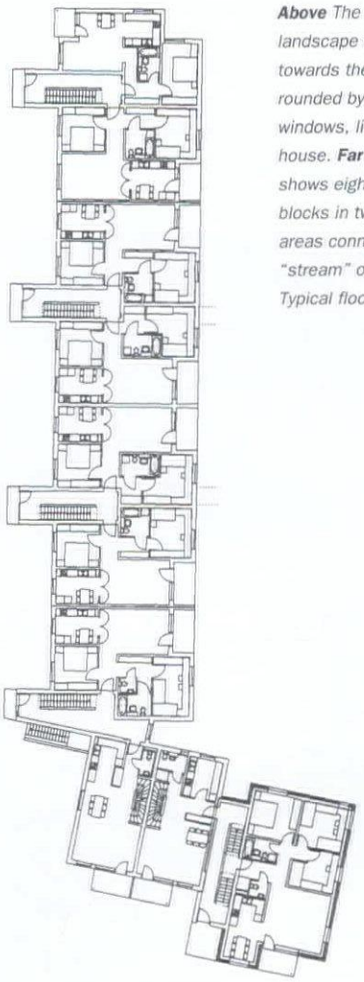
Goldstein-Sud, Frankfurt am Main, Germany

Architect Frank Gehry
Text/Photography Layla Dawson

"In America most of our work is for those of wealth and privilege." Early in his career Frank Gehry, the Californian architect most associated with decontructivist sculptural building such as the Vitra Chair Museum in Germany, cultural and commercial projects in America and most recently the Fred and Ginger office block duo in Prague, promised himself he would never design houses for rich clients. He began working on US government subsidised housing programmes but none of them were ever built. The invitation from Frankfurt's building senator and the Nassauische Heimstatte Wohnungs-und Entwicklungsgesellschaft housing association, with over seventy years experience of building and managing low cost projects, was therefore one he and Laurie D Olin, landscape architect of Hanna/Olin, Philadelphia, gladly accepted. Olin said "It was a pleasure for me to have the opportunity to work on housing anywhere in the world." When they saw the Frankfurt planning permission for the site in an outer residential suburb they were a little disappointed. They found it logical but stiff. Olin "wondered if we could change it, make figural space with the buildings. Frank said, 'Why not?' he's very good at saying why not." On a 2.26 hectare site in Goldstein Sud 162 flats and maisonettes, of which 31 are for disabled tenants, are grouped into eight five storey blocks. Gehry commented, "When I started planning there were no enclosures within the flats but we were soon

Opposite *A distinguished feature of this project is Gehry's plastic use of zinc cladding. Semi-enclosed balconies, stacked at the corners of the blocks with leaning sides give a serrated edge to the silhouette.* ***Below*** *Ochre paint, rather than more expensive brick, was used to make some blocks appear older than others*





Above *The south-facing landscape court is tilted towards the sun, and surrounded by balconies and windows, like an opera house.* ***Far left*** *Site plan shows eight different blocks in two landscaped areas connected by a "stream" of trees.* ***Left*** *Typical floor plan, block six*

Above left *Zinc clad entrances to both the blocks and bay window elements in the northern court.* ***Above*** *Shop space on the other outer northern edge of the site*

informed about what the tenants would prefer. So the plans may look ordinary but they were made ordinary with a lot of care." The eight different blocks are arranged around two interconnecting landscaped areas which flow across the site to link the surrounding older housing with a neighbouring sports and youth centre, kindergarten, school and woodland. Olin: "So the aim was to allow and entice people across the project. We used two metaphors; the stream and the theatre. In the north trees wind through the centre of the space like a stream which is an inversion of the bordering of spaces by lines of trees. Here the path is the stream of trees. We imagined the southern landscaped area, tilted towards the sun and surrounded by balconies and windows, as an opera house. Great outdoor spaces are street theatre, the public is both actor and audience." Gehry: "The building comes finished but you have to wait for landscaping. Waiting for trees to grow is frustrating. The intention is that you'll see vignettes of the building, parts and cuts between the landscaping, but the planned intimacy is not there yet. The blocks which are now ochre were originally meant to be in brick, to make them appear older than the yellow and white plastered blocks. That turned out to be too expensive but I was trying to give signals." The distinguishing feature of this project is Gehry's plastic use of zinc cladding. Rolling sheets sweep over the entrances and footbridges. Semi-enclosed balconies, stacked at the corners of the blocks, with leaning sides, give a serrated edge to the silhouette. Every imperfection in the flatness of the panels is reflected in light and shadow effects so that the buildings take on a homely self constructed look. Gehry: "I was trying to get texture. The shingling texture has sculptural strength." That such low cost housing has been built at all, when land and building costs in German cities bear no relationship to the rents most families can afford, is admirable. That Frank Gehry and Laurie Olin should be involved is astounding. This was a ploy by the city to make social housing acceptable to the neighbours by raising the architectural quality and public profile of the new project. The site was already owned by the housing associaton and Frankfurt and Hessen gave an interest free loan for a greater part of the 51.5 million DM project costs, which made possible a rent of 9.5 DM per square metre. Families chosen as tenants, Germans, Asians and many recently arrived Russian immigrants, have a minimum income of 40,000 DM per annum. Building began in 1994 and the first residents moved in this March. **WA**

Client	Nassauische Heimstatte Wohnungs und Entwicklungs Gesellschaft MBH Frankfurt am Main
Architect	Frank O Gehry
Project architects	Nassauische Heimstatte
Landscape architects	Hanna/Olin Philadelphia USA
Project landscape architects	Bodeker-Wagenfeld & Partner GmbH, Frankfurt am Main
Main contractor	Ed. Zublin AG, Frankfurt am Main

Right *A site at Berkel en Rodenrijs near Almere shows what the finished product will look like.* ***Below*** *The tunnel formwork in progress. The steel shutters and curing tents are moved along a section each day, resulting in a rapid construction of the basic wall and floor structures. Conduits and services are usually cast in situ during the shuttering process. Reference:* Skills and the construction process. A comparative study of vocational training and quality in social housebuilding *by Linda Clarke and Christine Wall. The Policy Press, UK. e-mail: tpp@bris.ac.uk . All photographs kindly provided by John Gilbert of John Gilbert Architects, Glasgow, UK*

Speed building Almere, Holland

The speed it takes to build houses in Holland is without parallel. The billion dollar question facing Dutch developers seeking to expand "system building" outside Holland is whether the process is nation specific. Would the system appeal to developments overseas? Tony Redhead from the Amsterdam based Construction Export Consultancy, Redex admitted "I have stopped using the word 'system' as it has bad connotations" although he argues that the Dutch system build techniques are "as much a hybrid method as the present manner of constructing houses in, for example, the UK".

The principle attributes of the Almere housing scheme, near Amsterdam are its generous space specifications and the consistently low prices. Added to this the hipped roofs create a large room where dormers or skylights can be added. Manus McGinty of Hillcrest Housing Association points out that "the ceilings are 2700 centimetres rather than the 2,300 centimetre average in modern Scottish housing schemes". And the price? Each 135 square metre house sells at 185,000 Guilders including land which, at the current rate of exchange, works out at less than £56,000 or US$84,000. So how do Dutch developers achieve this? The answer seems to be through intensive construction techniques and prefabricated elements. At the Leiderdorp based developer Noorlander Bouw's Voorhout site there is a permanent work force of 120 labourers who are able to complete seven houses per week.

Left *Prefabricated external timber skin fits into the external opening of the concrete structure. This then receives a brick outer skin, or somtimes an insulated render skin – the choice is the developer's.* ***Below*** *The hinged roof panel is the least site-labour intensive product. Hinges are fitted in the factory. Roofs are hoisted into position by a crane and three men in less than an hour per home.* ***Bottom*** *A prefabricated wall panel with door and window in place but unglazed. As labour is becoming harder to come by, more of the work is going into the factory where it can be controlled*

One of the elements that contributes towards this is the concrete tunnel form work. Tony Redhead stresses that this is "in situ concrete not pre-cast concrete which had a poor name in housing construction in the past". A practised team of four labourers has to strip and re-erect three sets of tunnel forms, fix all the reinforcement and service connections and place concrete in the same day. Even during the height of summer, calor gas heaters are placed inside the tunnel-formwork to raise the night-time temperature so that the concrete cures sufficiently to allow removal of the shuttering early the next day. Harry Clark, senior project engineer with Ove Arup & Partners Scotland points out that "It is heavy construction, so it would have to be done by a concrete frame contractor".

The other major element that contributes towards "Dutch speed building" is the use of prefabricated elements including the hinge roof manufactured by Opstalan which can be opened and lifted onto the house.

International application: in economic terms the method lends itself best to terraced housing. Psychologists have often cited the flatness of the Dutch landscape as the reason for the wealth of geometrical artistic styles, such as that of Mondrian and the De Stjil group, to have evolved in the Netherlands. Redhead argues that what he terms "fast-track building techniques" can also be used in "imaginative" developments.

John Gilbert of John Gilbert Architects, Scotland expressed concern about the layout that needs to be imposed because of the system. "It will not suit every site and a minimum of 50 houses is required before it is likely to be cost effective. However the strong formal pattern set up by the terraces does create a sense of street and space and the internal space standards are very good." **WA**

Project	Almere Housing, Amsterdam, Holland
Client/ Developer	Eurowoningen
Project architect	Aantjes
Developer/ contractor	Verwelius and Intervam

Public housing
Alcobendas, Spain

Architect Manuel de las Casas
Text David Cohn
Photographer Eduardo Sánchez

Manuel de las Casas is a leading figure in Spain's illustrious tradition of collective public housing design. He is the author of the renowned Palomeras Southeast (Madrid, 1978-86), tower blocks featuring tall circulation atria and L-shaped unit plans, as well as several succeeding works that are benchmarks for the continuing evolution of public housing. His latest project in Alcobendas, a suburban bedroom community northeast of Madrid, was the winner of a competition sponsored by Madrid's regional housing authority to promote technical experiments in construction. Working with the Ortiz construction company, de las Casas employed a prefabricated concrete panel system invented by engineer José Luis Cano.

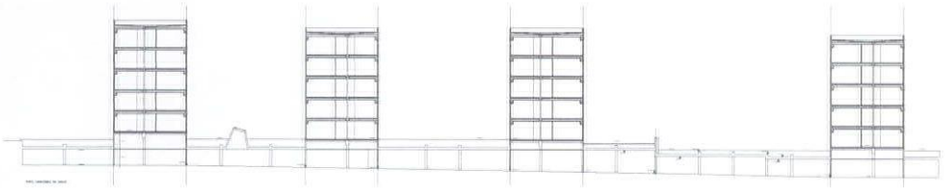
The Alcobendas project also marks a departure from the closed patio-blocks that have characterised Madrid Sur and other public developments of the late 1980s, seeking a balance between the high-density urban continuity of the nineteenth century city and the benefits of the modern movement's open plan in terms of light, air and views.

The 198 units consist mainly of three bedroom, 75 square metre apartments, arranged in five lineal five-storey blocks, relatively closed to the exterior but with an open, splayed interior composition, like the fingers of a hand, with carefully-controlled views between them and through block entries to the exterior. An underground parking garage is memorably illuminated by tile-covered Corbusian cones that randomly punctuate the paved open spaces.

De las Casas' elegant plans always experiment with established practice. In this case, the linear units with a central band of services are similar to his Bermenejales project in Sevilla of 1993. Apartments are arranged four to a landing, instead of the traditional two per floor, sacrificing the usual double exposure of units on opposite facades in order to have the required vertical circulation. But more than half have two exposures on building corners and many feature an extra balcony off the main bedroom.

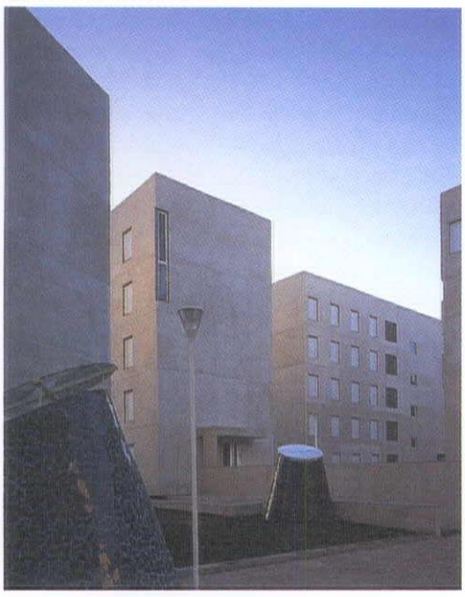
The precast 12 millimetre thick structural panels are exposed on the exterior; a concrete mix with white limestone sands and white titanium pigment, finished with an acid bath instead of sandblasting, gives the panels a soft luminous ivory-coloured texture. Joints are filled with silicon and create interesting cantilevered patterns around openings and at projecting corner balconies. Panel window openings are lined in steel and perforated steel panels screen code-mandated clothes-drying balconies off the kitchens. The bearing exterior walls allow the deep pan slabs to span the ten metre-wide interiors without intermediate supports. Apartment partitions are built on top of the finished black terrazzo tile floors, allowing layouts to be changed over time. Bearing walls and ceilings are finished in gypsum board (the deep slabs provide excellent floor-to-floor acoustic insulation).

Like most public housing of its generation, Alcobendas is organised as an owner's cooperative. Moderate-income families that meet the housing authority criteria are able to buy units with down payments of roughly 1.5 million



Opposite *A view of the scheme from the open side showing the angled housing blocks flaring out "like the fingers of a hand" to capitalise on natural light and allow views of the surrounding area.* ***Top*** *Site plan showing individual floor plans.* ***Above*** *Section through the housing blocks showing underground parking area.*

Below left *Monumental housing blocks are linked by a pathway punctuated by tiled conical structures which allow light into the car park below.* ***Below right*** *Like Alvaro Siza and Le Corbusier before him, de las Casas returns to the crisp volumetric compositions of classical Greece*

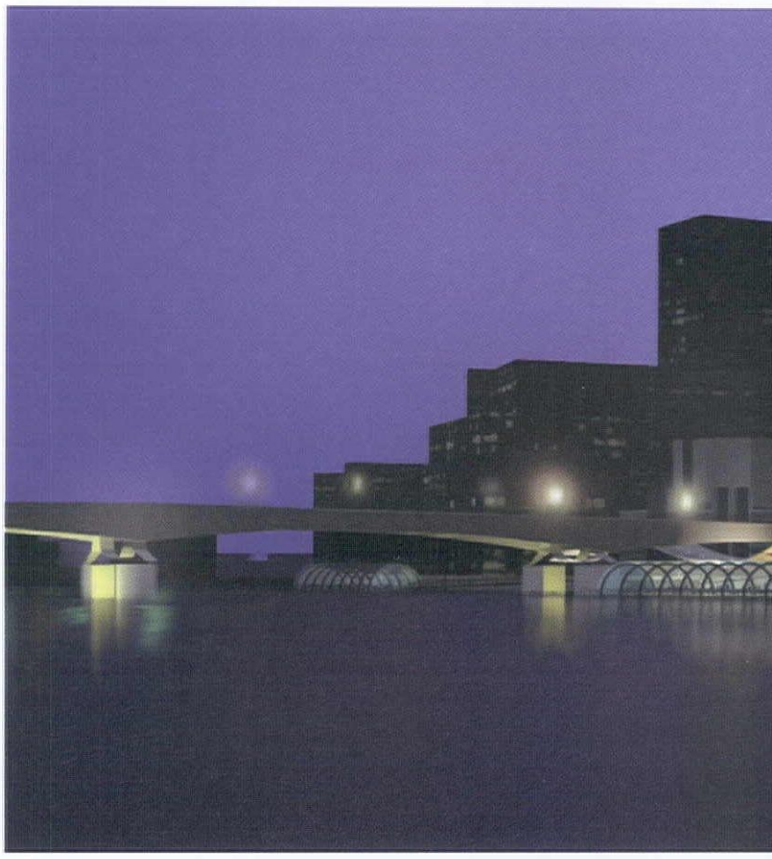


pesetas (US$12,000) and 15 year loans at a government subsidised rate of nine percent (recently lowerd to 7.5). Units cost an average of 5.7 million pesetas to build (US$45,000); land development and soft costs raise prices to between nine and 11 million, depending on the size and location of units. The land was expropriated and urbanised by the local government, with islands of fenced developments separated by parkland with an access ring road. De las Casas has become an expert at designing through the limitations of such plans. Here, like Alvaro Siza and Le Corbusier before him, he returns to the crisp volumetric compositions of classical Greece, of luminous angled masses under a blue Mediterranean sky, in striking contrast to the conventional red brick housing blocks of the immediate surroundings. **WA**

Client	IVIMA (Housing Institute), Community of Madrid
Architect	Manuel de las Casas
Collaborators	L F Jurado, P Sánchez
Assistants	J. Blanco, P. de la Puente, S. de las Casas, C. Izquierdo
Technical architects	A. Laiz, J. Rives
Structural consultant	José Luis Cano
Plastic studies	Felicidad Rodríguez
Landscaping	I. de las Casas
Builder	Ortíz
Building cost	1,265 million pesetas (US$10 million)
Built area:	19.590 square metres

CAD: The story so far

Much has been made of the new electronic age. With the possibility of new means of communication and interpretation on the horizon how will architecture be affected? Sutherland Lyall assesses the pros and cons of computer aided design (CAD) and finds that patience and considered development may be the key to its success as a fully integrated architectural tool.



Here in the middle of the first electronic drawing age there is something rather odd about producing electronic imitations of those arcane arrangements of lines on big sheets of paper which historically one group, architects, hoped would be successfully interpreted by another group, contractors and product manufacturers – the result being a completed building. For some, though happily not all, the nail-biting uncertainty involved in this transaction is where the true spirit of architectural practice lies. However you feel that there must soon be other ways of doing such things. But until computer aided manufacture (CAM) comes to architectural practice, CAD is going to occupy a curiously uncertain position as a sort of simulacrum, a kind of horseless carriage which has not yet become a fully fledged automobile with its own reasons for being.

Nevertheless there are inherently nice things about architectural computer aided design. One is that it's remarkably democratic and ignores political boundaries. The fact is that its use is independent of both practice size and location. In theory, and pretty much in practice, you can zap files around the globe and have them appear on the hard disks and screens of your collaborators in Seoul, Karachi, Valparaiso and New York ready for on-screen brainstorming or simply printing out for the local contractors. If you're a one man band it's only a bit of a financial stretch to buy the same computer and applications used by those heavy-duty practices whose CEOs casually hire journalists as outriders during site visits. Whether you use PCs, Windows NT and Alpha chips or are a communicant of the First Church of Cupertino, it makes no difference. The international construction computing community has developed its own de-facto file transfer protocol in the form of the DXF standard. Because DXF files are platform-independent you can design in Mac-based MiniCad amend in PC-only AutoCad and present in, say, MicroStation.

Despite the mythologies CAD normally takes longer, and it is inherently more difficult to produce a set of drawings via CAD than under the old hand methods. It's not inherently faster. To begin with that is. But once the basic model is constructed in the computer everything changes. Architectural drawings almost always have to be extensively changed. Doing that by hand means doing the drawing over and over again and wearing away razor blades and tracing paper. So where CAD starts to make wonderful sense is when, inevitably, revisions are needed and more detailed drawings are asked for, as they always are. Scale is no longer relevant because everything is, as it were, full size and dimensioning is very difficult to get wrong. There's one famous case of wrong dimensioning. It occurred when a technician faked up a computer drawing because the queue for the terminal was too long that day. And the basic building model is relatively easy to transform into a 3D model for such things as presentations, fly throughs, wind and sun, thermal response, environmental and lighting studies – and for structural and services analyses.

Of the mainstream CAD programs, AutoDesk with its 2D drafting package AutoCad, has a vice-like grip on the PC world – and it's special position is underlined by its proprietorship of the DXF file format. There are actually rather a lot of alternatives out there hoping to topple AutoDesk from its dominant position, among them CADDS 5, CADBAU FastCad, Star

Hayes Davidson computer aided design of Richard Rogers Architects proposal for the South Bank, London

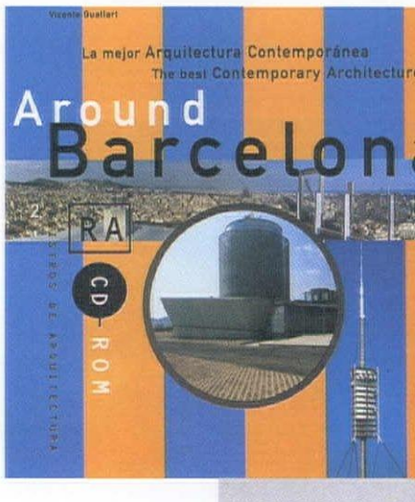
Archi, paraCAD+. And such Mac applications as MiniCAD and ArchiCAD. One suspects, though, that the real growth area in CAD is in the area of using the building model generated in one or other of the above as the basis for further analysis. For example there's a current buzz about internal analysis using CFD, a crisp contraction of the ungainly expression Computational Fluid Dynamics. CFD programs such as Phoenics-VR, Fluent and CFX, provide visual demonstrations of air movement inside buildings as the basis for more detailed analyses of unusual spaces – and for maximising the performance of environmental control systems. Similarly programs such as Radiance provide a three dimensional model of both day-round natural lighting and artificial light sources. CADSYS assembles and links elements involved in mechanical services design.

Reality?

People in other areas of design prize the ability to create worlds and images which are the unique creation of computer programs and do not mimic the real world. Architects don't have such fun: their CAD images *have* to look realistic on the grounds that to do otherwise would constitute misrepresentation. But it's not at all straightforward. When the first colour photocopiers came out people copied banknotes and successfully passed them off as genuine. It's claimed that each generation's art fakes are easily detectable by their successors. So too has the vaunted "photographic" reality of earlier CAD-based images become risible for our own generation – which, amusingly, is claiming a similar ability to successfully mimic reality with images which in almost all cases are to the outsiders eye still plainly generated on computer. Brilliant British architectural perspectivist, Alan Davidson, of Hayes Davidson, argues that it's only for the moment that clients are easily seduced by 3D CAD images. They are still novel, in the same way that blocky but so-far-convincing virtual reality images are. They also seem to be more "accurate". But, he says, "clients are going to get used to them." Probably quite soon.

To come

CAD is insufficiently sophisticated yet for it to be a real concept-to-production thing. It's actually not all that often used even as a concept thing in the way that it is beginning to be used by new generation visual designers. For some of them a thoroughgoing familiarity with the software has begun to enable them to deploy serendipity as a design tool in the old way. The trouble with current CAD applications is that they are stultifyingly and deadly serious. They have to be. And at heart they are 2D. Because they are conceived as electronic drafting machines. That's fine for architects who design in plan and elevation. But architecture is really about three dimensional space. Maybe what's needed is a plastic, stretchable, deformable, tentative, intuitive front-end 3D sketching application which can export its approximately scaled images into bread and butter, dimensioned, 2D drafting applications for quick appraisals and, later, for finally drawing out. There are indeed a number of great solid modelling applications out there. None of them yet can demonstrate the ability to cope with slackness, approximation and that nice old creative wrong-headedness. Maybe its about time they did. And maybe we should start re-thinking how to use electronic design creatively rather than in imitation of the time-honoured paper analogy. **WA**



Pushing the boundaries

Vicente Guallart, Barcelona-based architect and editor/producer of the CD ROM series *Registers of Architecture*, recently launched a new CD ROM with his company, NEWMedia, in time for the UIA Congress back in July. *The Best Contemporary Architecture Around Barcelona*, (otherwise known as *Around Barcelona)* has "50 buildings, 70 architects, 120 minutes of audio-video, 640 megabytes and 1,200 screens" and has been an immediate success. Users are able to edit their own pages with photographs and sketches, and converse with eminent architects, even draw over the images of master's buildings in an attempt to follow their creative method. But this is only the beginning. In conversation with Guallart, Georgi Stanishev tells the story behind the evolution of *Around Barcelona* and hints at new ideas for the future.

Beyond architecture as a physical object and defining space, we are now quite used to interpreting architecture through models, drawings, plans and criticism in journals, and occasionally through films and video too. Now all these methods of representation are digitalised and combined to create a new vision of architecture constructed as a multi-layered media and distributed on CD ROM disks. Vicente Guallart, an architect from Barcelona launched a new initiative in CD ROM technology earlier this year, inspired by a gap in the market. CD ROMs for the architectural world have existed for several years, but have only provided collections of renderings and data, more like encylopedias or museums. Guallart was inspired to design a CD that would provide a tool for expressing his conceptual vision of architecture. The disks are aimed at a cross-section of users, from architects and students wishing to understand the work of their contemporaries, to architectural critics and non-architects. The possibilities for a "Socratic" form of teaching through the spoken word are stressed by Guallart; teachers and students are able to draw their own ideas and write their own texts, as well as listen to words from the architects themselves. As with CDs in other disciplines, they have been designed to be used according to the user's requirements.

His output to date includes an architectural survey of a geographically defined area, *Around Barcelona*, and a critical portrait of a well known Spanish architect and ex-editor of the Spanish journal *Quaderns*, Josep Lluis Mateo, for whom Guallart once worked. Living in Barcelona and being familiar with the work of Mateo – who is a promoter of new ways of communicating in architecture – these two disks seemed the logical starting point. A third disk, a critical appraisal of the work of Enric Miralles, showing his unique drawing process unravelled line by line on the screen, is currently in production.

"After this Catalan trilogy (Mateo/Barcelona/Miralles) we will be preparing three different series: one on architects, *Lectures of Architecture*, the second on *Architecture around Cities* and a third on *Contemporary Buildings*. We are working on *Contemporary Architecture around Berlin*, and may be doing one with Bernard Tschumi with the Netherlands Institute of Architecture. We are also preparing a CD ROM on emerging architecture in Europe in collaboration with different European Museums and Architecture Centres."

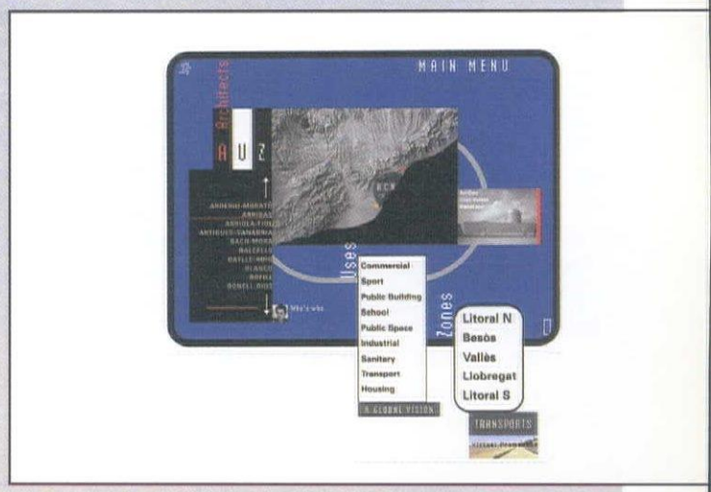
When the user enters the virtual world of *Around Barcelona* they are challenged to investigate a selection of 50 significant works of architecture, built within the Greater Barcelona area during the build up to the 1992 Olympics. These works can be researched via three lists:

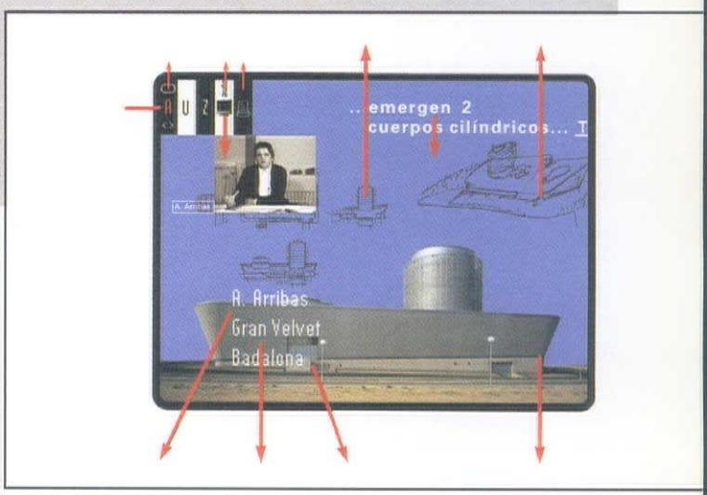
i) the architects – provided with their CV and summaries of other projects

ii) the uses – functional categories, such as sport, residential, commercial etc

iii) zones – the geographical area within Barcelona in which the project is situated.

Each built work is represented with a sequence of principal drawings that may be explored in detail, from general plans to details, and includes concept sketches by the architects, images of the building from different angles, and complete details of how to get to the site. At any point on the information highway the user may request more detailed data in the form of explanatory texts or notes from the architects. When *WA* tested this software one randomly chosen command resulted in an audience with a fully animated designer, much like watching a film. The list of concepts behind a particular project's creation was listed in handwriting scrawled across the screen as each point was made by the designer.





Above left *Cover to the CD ROM* Around Barcelona. ***Above*** *Vicente Guallart.* ***Top right*** *Screen image from* Around Barcelona *showing the main menu, with options for exploring architects, uses or zones.* ***Bottom right*** *Screen image from* Around Barcelona *showing architects' sketches, models and collages. Users manipulate the original material to reveal the architects' thoughts*

The user controls the appearance of each screen by navigating in a simple and logical way between plans, sections and photographs, and manages the visualisation of the building or public space from different points of view. The organisation of CD ROM space provides the possibility of jumping from one level of the presentation to another without following a hierarchical structure, as in the World Wide Web hypertext space. Another stimulating option lets the user play with elements of the presentation creating his own "pages" and his personal understanding and appreciation of the work. Furthermore, he can experiment with the images using the provided pencil tool as an analytical instrument, bravely drawing over the master's sketches or building photos, in an attempt to understand the process of form creation. If what you create is, in your opinion, better than the real thing there is the option to save it on your hard disk.

Besides the option of having the pictures, videos and the architect's voices in one format, the main advantages of the CD ROM publications lie in the creative freedom granted to the reader; in the possibilities to experiment with different ways of reading one work of architecture, to act as a critic or editor, and to formulate a personal and individual understanding of the subject. The reader is granted privileged access to the architect's thoughts and intentions, and takes part in a critical dialogue with the imagery of his projects and built works, superimposing his own ideas by means of colour, line and text. As Vicente Guallart puts it, "the options given by the CD ROM space minimise the restricting effects of the editorial functions of the magazines and books, because these roles are simpy delegated to the reader himself, putting him in a direct relation to the subject – the architect and his buildings".

Also on the list of registers, *Be Critic* adds yet another inventive option enabling the reader to express his personal critical views on Mateo's work (in the case of the Josep Lluis Mateo disk) and to share it further in the Registros Electronic Forum, accessible by internet (registros@pa.ups.es). As conceived by Vicente Guallart, the selected texts will be published in the next CD ROM, and will be commented on in the "Forum" by Mateo and other architects, leading to a continuous critical dialogue on an international scale. Thus Vicente Guallart marks yet another stage of the interactive presentation of architecture via the internet multimedia dialogous space, where collective discussions on a certain project, conception, or built work could be held between users, architecture students, teachers, critics and designers. **WA**

The disks are produced by RA Producciones NEWMedia SL, Nou de la Rambla 24, int, Barcelona 08001, Spain. Telephone: +34 3 318 0377, facsimile: +34 3 302 0247.

The distribution cost is around US$55 (depending on exchange rates). Students and subscribers are given a 20 percent discount.

Software: MM Director 4.0. Adobe Photoshop. Adobe Illustrator. Adobe Premiere. Compatiblity: Minimum configuration; PC 486 3.1/Windows 95. 8MB RAM, 256 Colours. Also Macintosh LC/Power Macintosh, System 7, 8MB RAM, 256 Colours. Available in English and Spanish. Architecture guides also in French, German and Catalan.

Distributors: The two major distributors are ACTAR, publishers of the Spanish journal *Quaderns*, and COMPUTER 2000.

The forum is not yet working, but users can send their comments to racdrom@arquired.es, or visit the WEB site at http://www.arquired.es/racdrom

Displacement ventilation

Second Bangkok International Airport, Bangkok, Thailand

Flack + Kurtz, consulting engineers for the Murphy/Jahn designed second Bangkok International Airport in Thailand, have elected to use displacement ventilation, a concept that has yet to be accomplished in such a large space, but one that was fully evaluated using computational fluid dynamics (CFD).

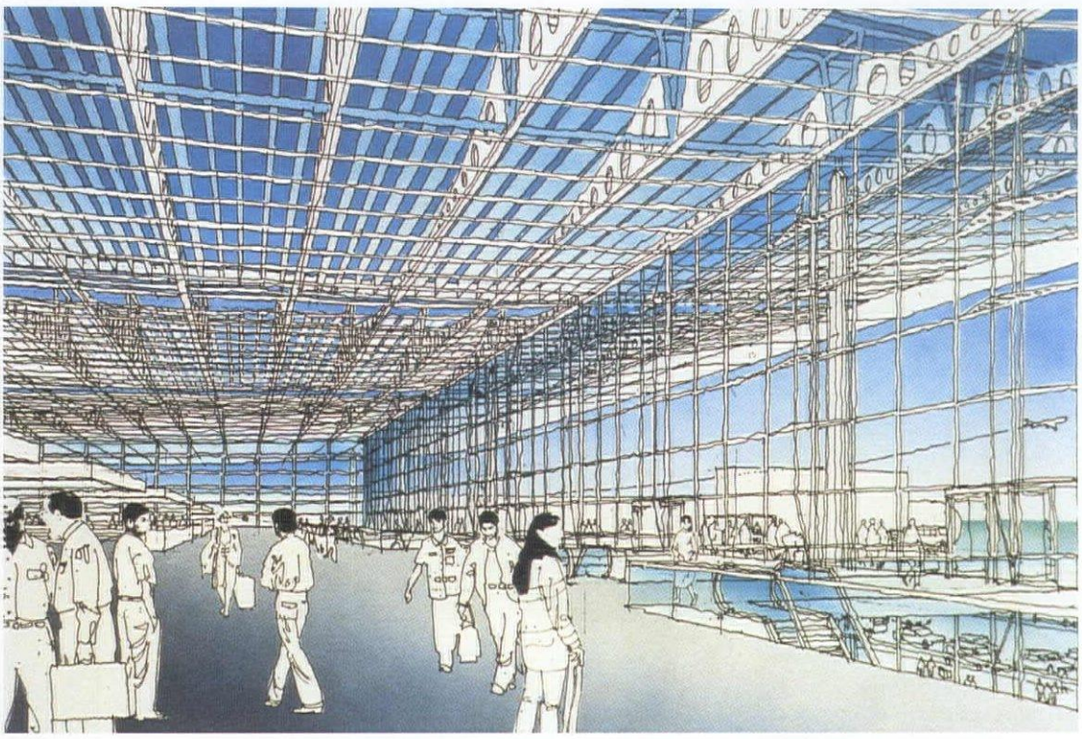
Due for completion in the year 2000, the building will be a glass and steel construction comprising 5.5 million square feet of arrival and departure halls, check-in and ticket areas and offices. Flack + Kurtz aim to develop a design that will be both energy efficient and create a comfortable environment for the occupants. Due to the airport's geographical location and its 24 hour operation period, the amount of energy required to condition the building is vast.

Examination of the CFD analysis shows that the predicted indoor air temperature will be virtually the same, or in some cases slightly higher than the ambient temperatures, eliminating the conduction heat gain to the building as a whole. As a result of using a virtually constant volume system, fan power has also been reduced with further savings in energy consumption.

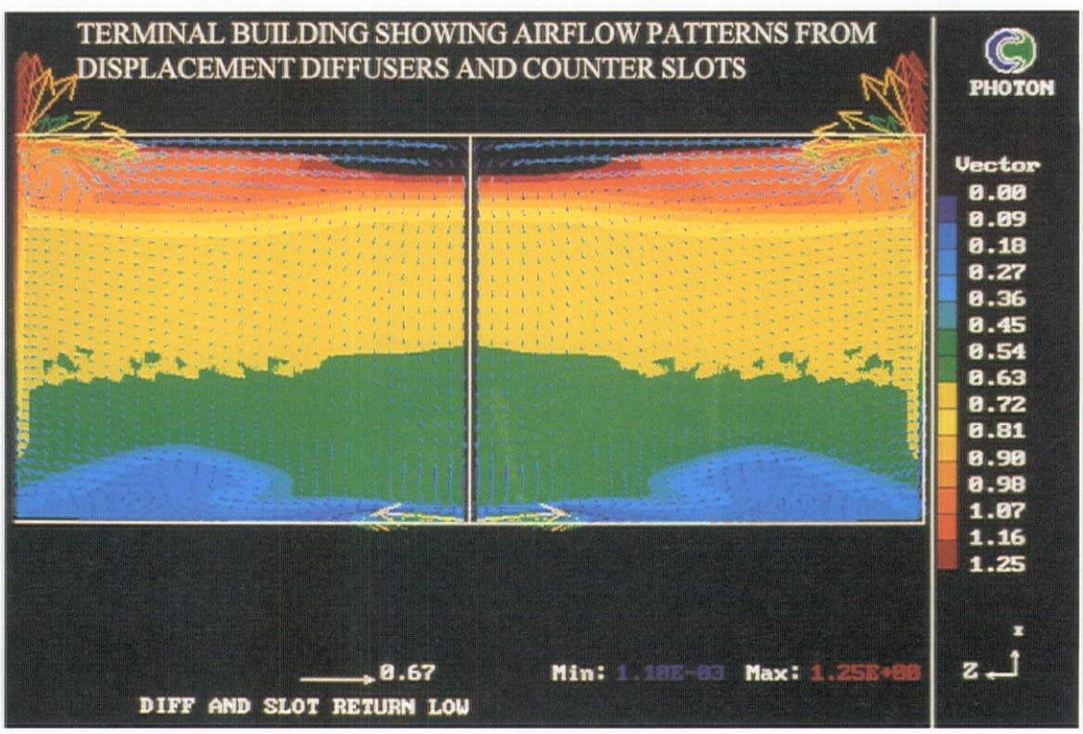
In the main terminal building, the original concept was to supply air via jets situated above the check in counters, with displacement diffusers between the counters supplying the remaining portion of the conditioning air. However, this analysis showed that the jets induced too much air at room temperature which resulted in a very poor temperature gradient. In the final design, air is supplied via slots under the counters to create the required environment.

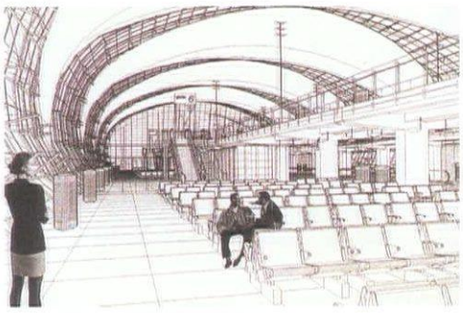
The concourse area was more complicated due to its geometry and the complexity of having both arrivals and departures in a common space. Here displacement ventilation has been used to supply a blanket of air across the floor which produces a stratified layer to ensure that the occupied zone remains within the comfort limits. **WA**

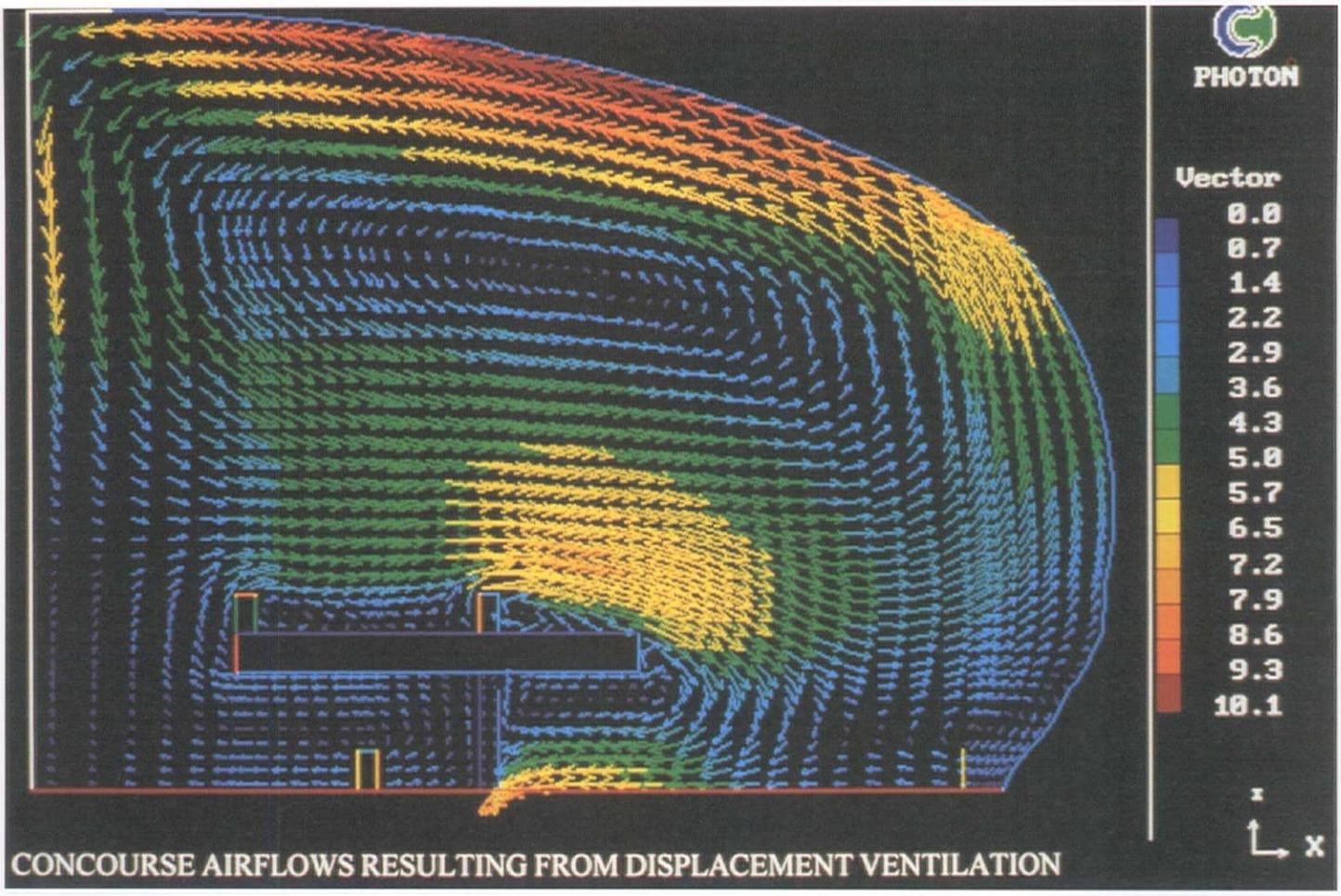
Architects	Murphy/Jahn
Consulting Engineers	Flack + Kurtz
Software	Phoenics 2.0



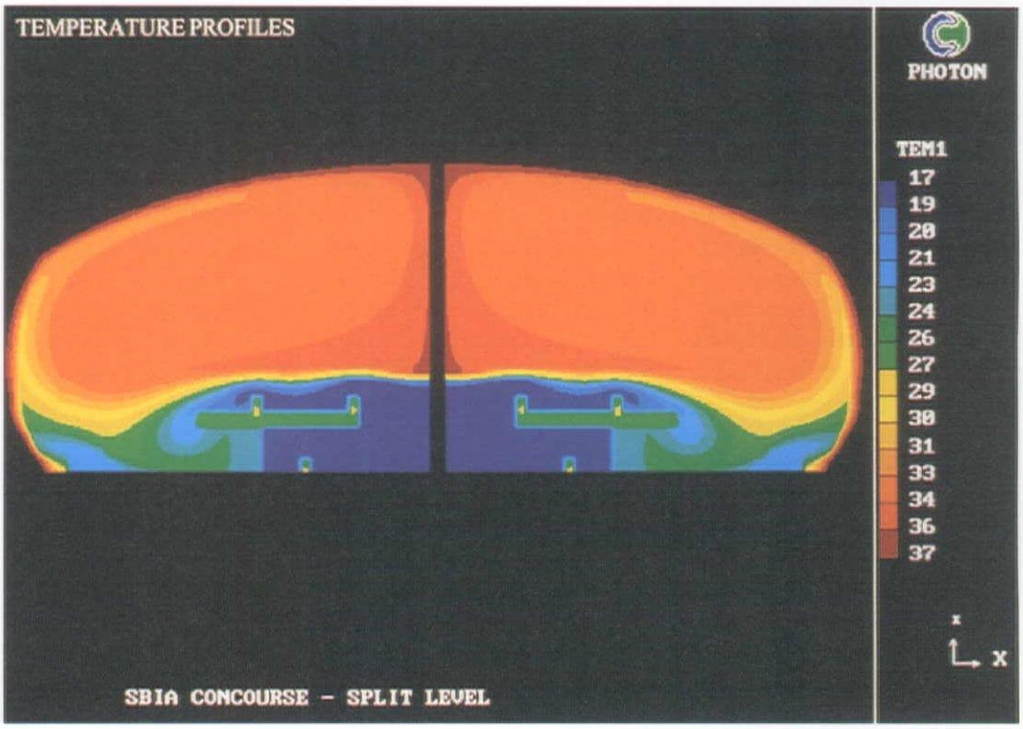
Above *Interior perspective of terminal building.* ***Below*** *Terminal building showing air flow patterns from displacement diffusers and counter slots*





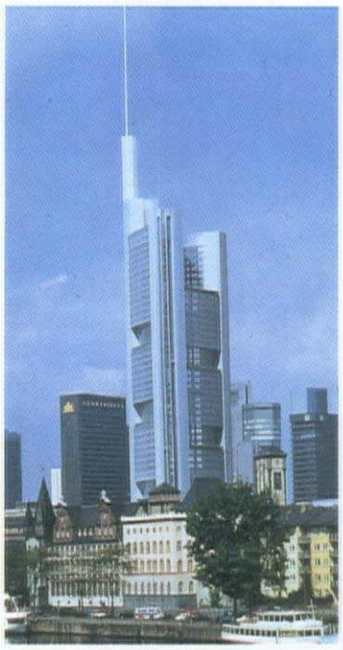


Top *Interior perspective of airport concourse.* ***Above*** *Concourse airflows resulting from displacement ventilation.* ***Right*** *Concourse showing temperature profiles resulting from displacement ventilation*

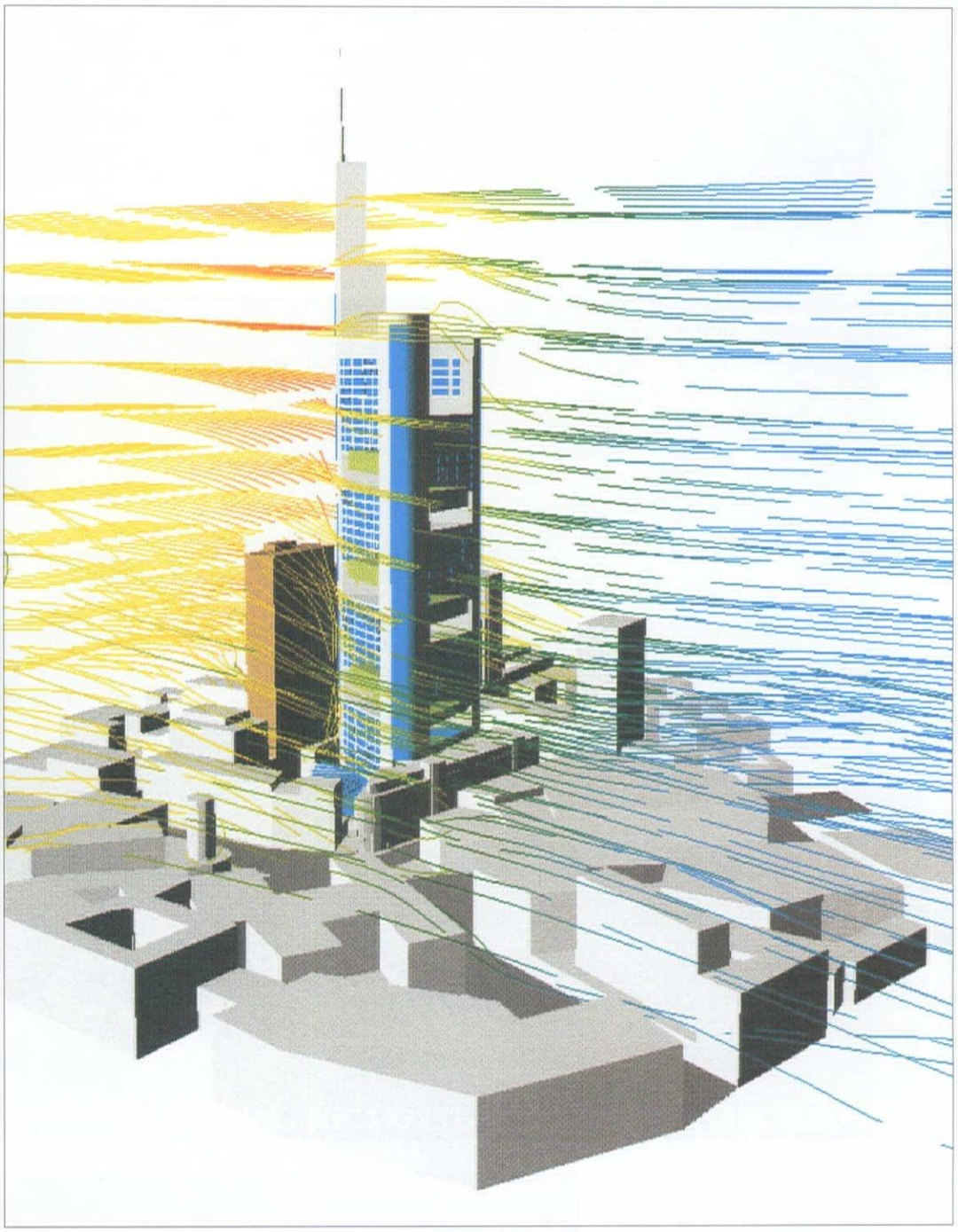


Saving energy

Commerzbank, Frankfurt am Main, Germany



Richard Davies



Above *Architect's photo montage*
Right *CFD 3D visualisation modelling showing wind flow patterns*

The desire to produce an ecological building by minimising energy consumption led to the use of computational fluid dynamics (CFD) software and Dynamic Thermal Modelling techniques for the design of the new headquarters building for Commerzbank.

Designed by Foster and Partners, the building is due for completion in 1997. It is a 300 metre high office development in the centre of Frankfurt designed to house 2,400 people in a three sided tower wrapped around a full height central atrium. The objective was to create a pleasant working environment for the occupants, which has been achieved by the creation of three 12-storey "villages", each with three four-storey sky gardens linked to the atrium. All the offices are cellular and all have either an outward or sky garden view with access to fresh air. Between each "village", the atria is separated horizontally to limit the stack pressures and smoke spread.

Consulting engineers RP+K Sozietät GmbH, were appointed to assess the implications of natural ventilation on energy consumption, choice of cladding system and interior comfort levels. This viability assessment resulted in a number of detailed studies, using CFD software and Dynamic Thermal Modelling Techniques. The first of these was a comprehensive climatic analysis to determine the Expected External Availability (EEA) of natural ventilation. For high rise office buildings this analysis can include information on local wind conditions, ambient temperatures, precipitation, solar radiation influences and even surrounding structures.

Several other parameters were also considered and analysed including the thermal mass of the building, the cladding system and type of openings, type of ventilation and partitioning, internal heat gains and comfort criteria. CFD and thermal simulations were modelled for thermal performance and comfort assessment, HVAC systems design, gardens and cladding optimisation, the latter also verified by wind tunnel tests.

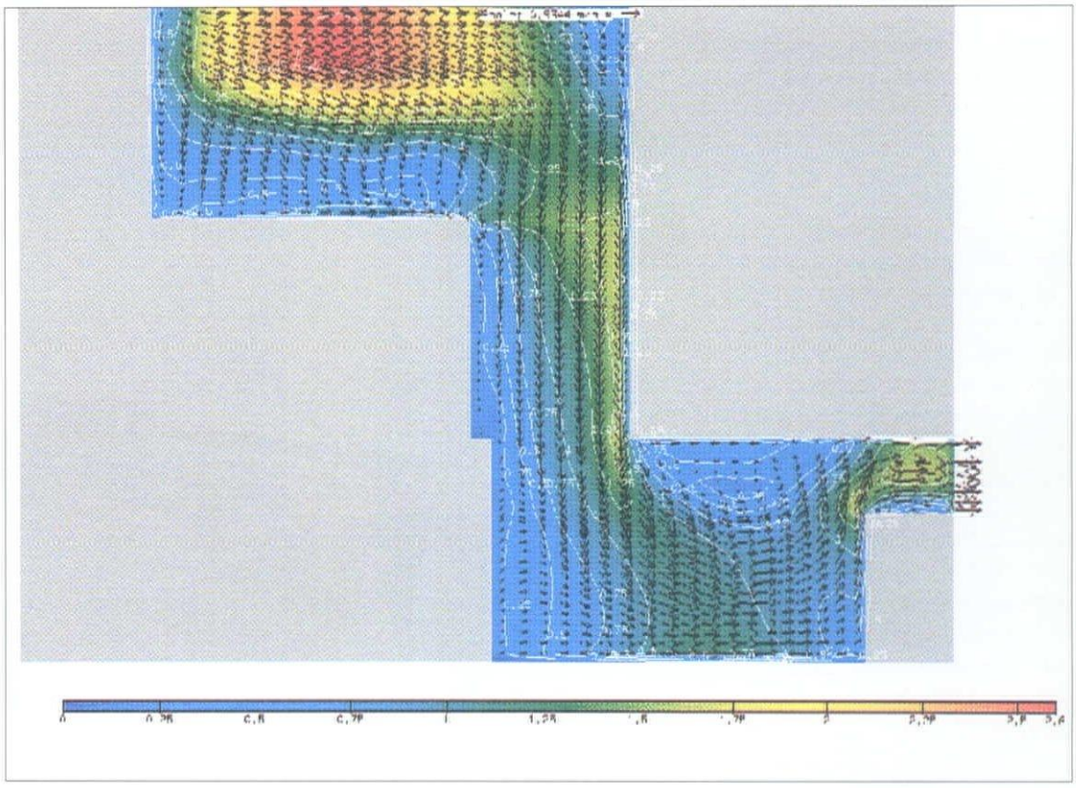
Natural ventilation performance indices were produced for Expected External Availability (EEA) which considers climatic influences and Expected Internal Utilisation (EIU), which takes into account all other factors, from the choice of facade to the occupancy patterns of the interior space.

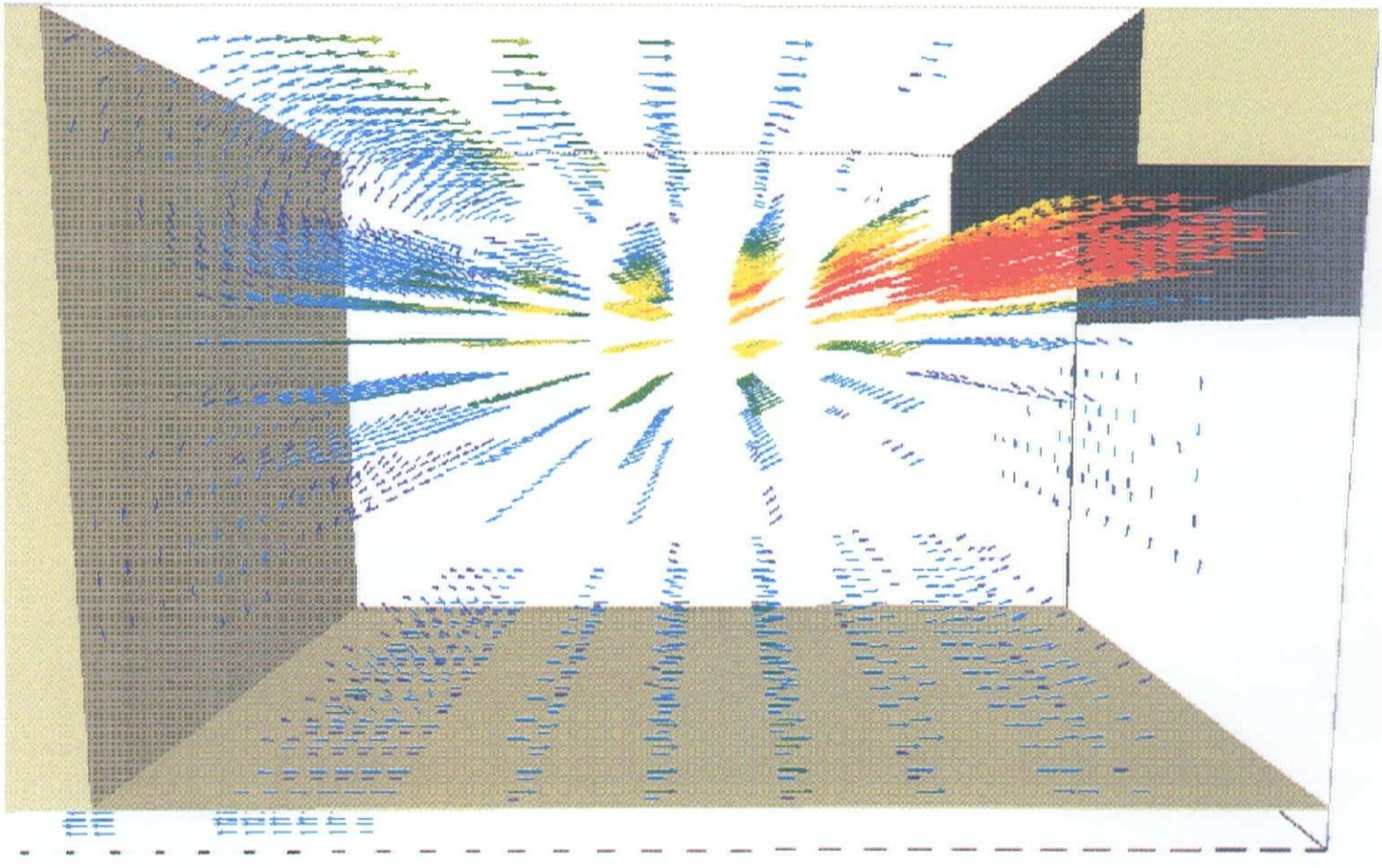
The results of these analyses helped to firm up the garden, window and cladding design, and showed that natural ventilation could be beneficially used for about 60 percent of the occupied time, with a mechanical system in use for the remainder. The energy savings compared to traditional buildings were 50 percent overall. **WA**

Environmental Design & Analysis	RP+K Sozietät GmbH, part of Roger Preston International
Architect	Foster & Partners
Software	ARIA, TAS, ESP+

Right *Office tower with openable windows designed for high comfort levels and low energy usage*

Below *CFD office natural ventilation simulation, optimizing window opening size and comfort conditions*





Fire and safety

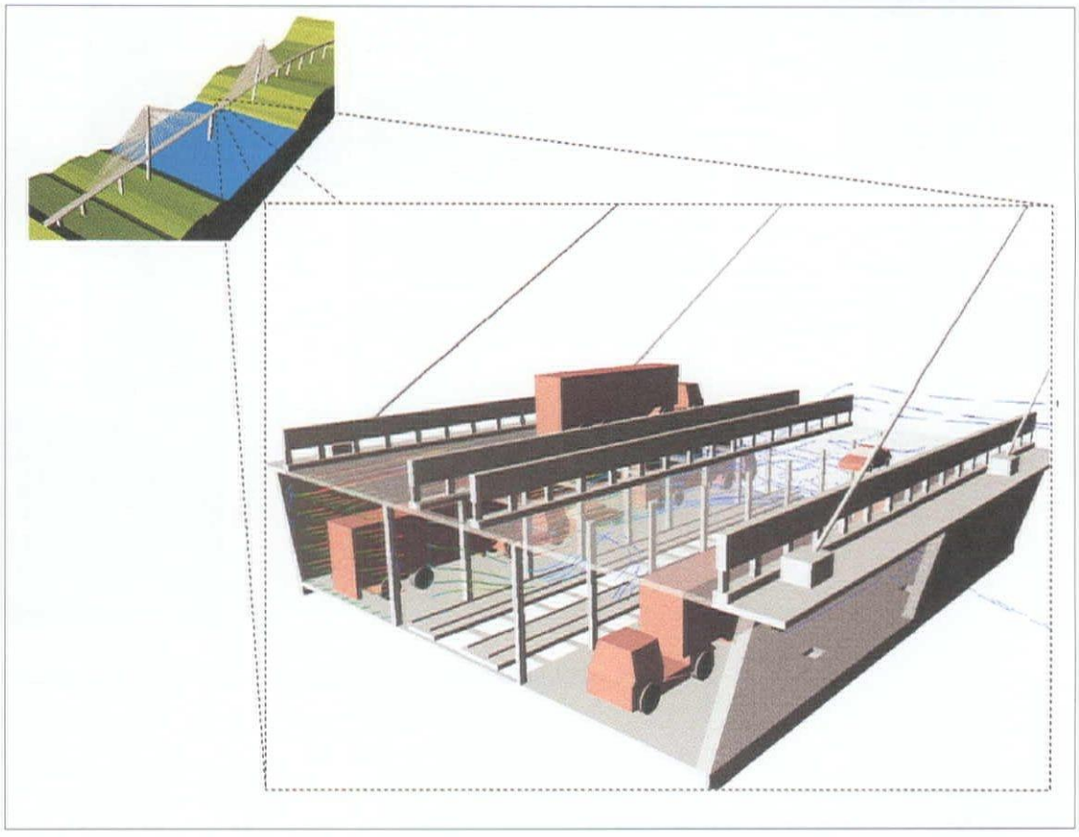
Kap Shui Mun Bridge, Hong Kong

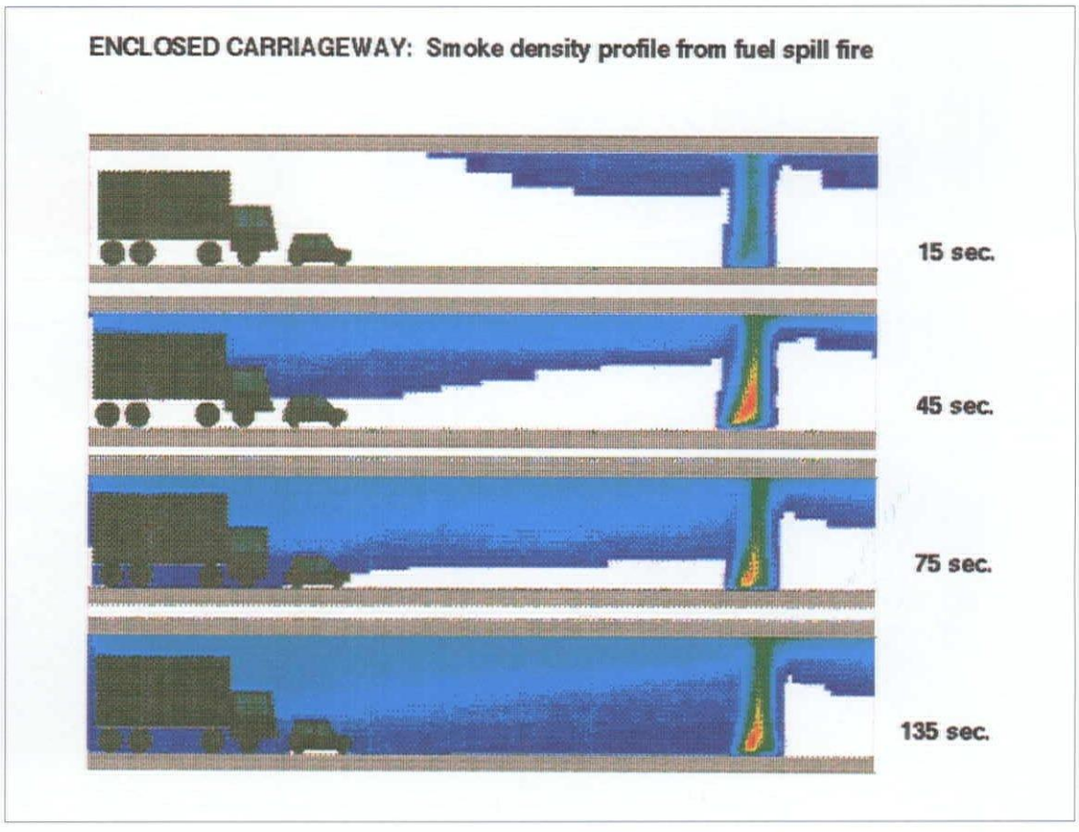
Right *Perspective view.* ***Below*** *Cut-through centre section showing natural ventilation openings.* ***Bottom*** *Enclosed carriageway: smoke density profile from fuel spill fire – a typical example of the technical material produced from the fire simulations*

Roger Preston & Partners were commissioned to undertake two computer simulation studies of the Kap Shui Mun Bridge – one to predict smoke and fire behaviour and the other to determine the level of pollutants that passengers may be subjected to, particularly traffic fumes. The bridge forms part of the new Chek Lap Kok airport development programme in Hong Kong, linking Lantau Island to West Kowloon, and carrying both road traffic and the airport railway. It has been designed to withstand the high winds and heavy rainfall prevalent in this area and as such, each carriageway is fully enclosed with ventilation provided by wall fixed jet fans.

The fire and smoke studies were undertaken in the UK by RPP in conjunction with the Fire Research Station (FRS), part of the Building Research Establishment. The two major hazards considered were smoke and high temperatures. Both RPP's computational fluid dynamics (CFD) software, ARIA, and the FRS' technical CFD programme, JASMINE, were employed to model the effects of two scenarios of fuel spill pool fires on separate sections of the Lantau Fixed Crossing. In both simulations, traffic upstream of the fire was assumed to be trapped while those downstream of the fire source had a clear escape route.

The purpose of the simulations was to determine whether the specified jet fans were capable of forcing smoke downstream away from trapped vehicles and also to determine the extent to which visibility would be limited. Temperature increase was examined in order to estimate the evacuation time. The final optimised design used jet fans to keep visibility within the acceptable limits and generally transport the combustion products in the desired direction. **WA**



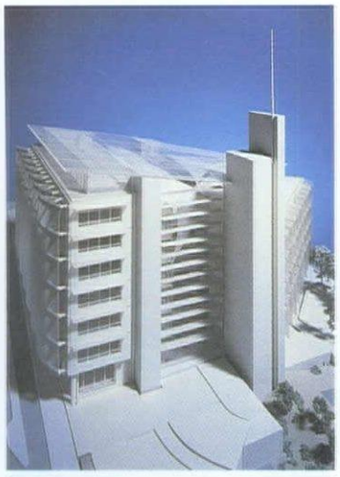


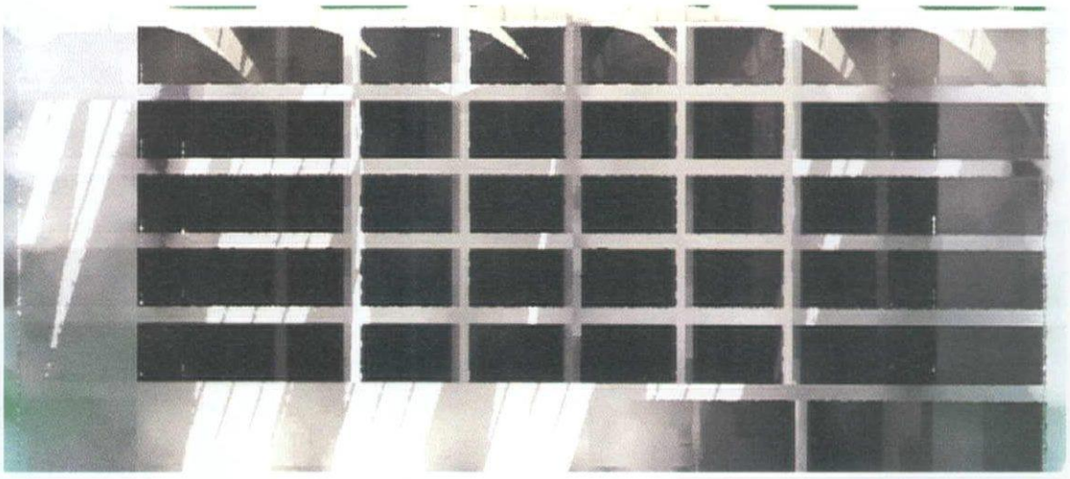
Design Consulting engineers	Greiner Int Ltd Roger Preston & Partners, part of Roger Preston International
Software	ARIA, JASMINE
Project engineers	Mott MacDonald, Hong Kong Ltd

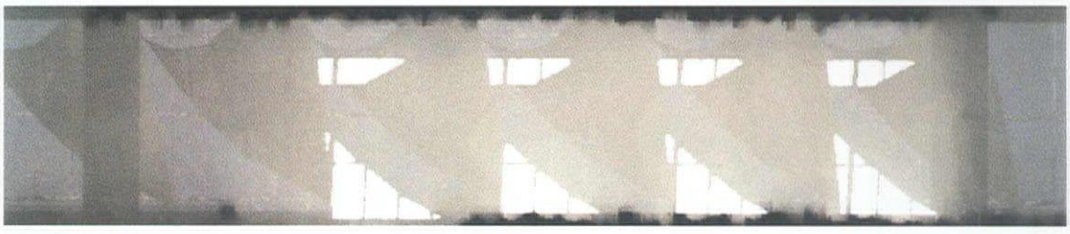
Lighting in Lisbon

Parque Expo '98 SA, Lisbon, Portugal

Architectural team	EPR Architects, London ARQUI III, Lisbon Mahieu, Brussels Daviel SA, Paris
Software	Radiance, TAS, ARIA
Consulting engineers	Roger Preston & Partners,part of Roger Preston International







Above *Photograph of the architects model. Atria Shadow Analysis, 16 July at 12.00 hours,* ***above right*** *east elevation,* ***right*** *floor plan analysis.* ***Below right*** *Perspective image of atria*

The design of the new headquarters of Parque Expo 98, specifically addresses local climatic conditions. It provides a high level of solar protection to cope with all sun angles, eliminate heat gain and glare. Following a detailed environmental analysis of the building by the consulting engineers Roger Preston & Partners; four main areas were identified – the shading performance of the external facade, atrium design, building response optimisation and the comfort conditions within the office areas.

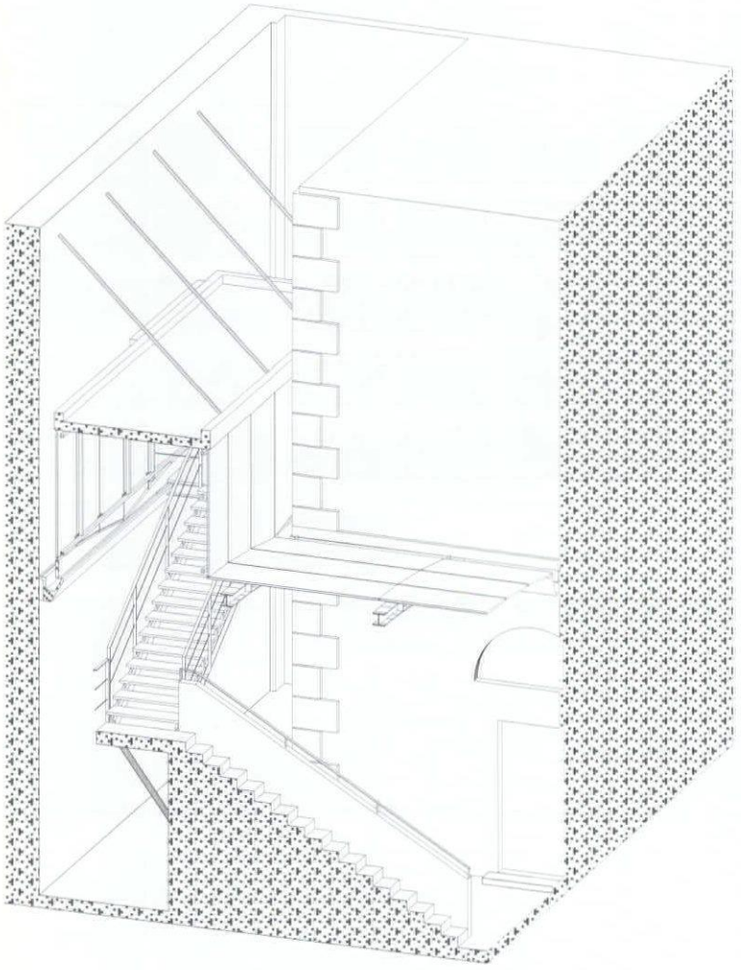
Designed by international competition winners EPR Architects and ARQUE III, the development will be the first office development around the Expo Site in Lisbon. It provides 11,000 square metres of office space in two adjacent low energy buildings linked by an atrium, with views over the Expo site and the river.

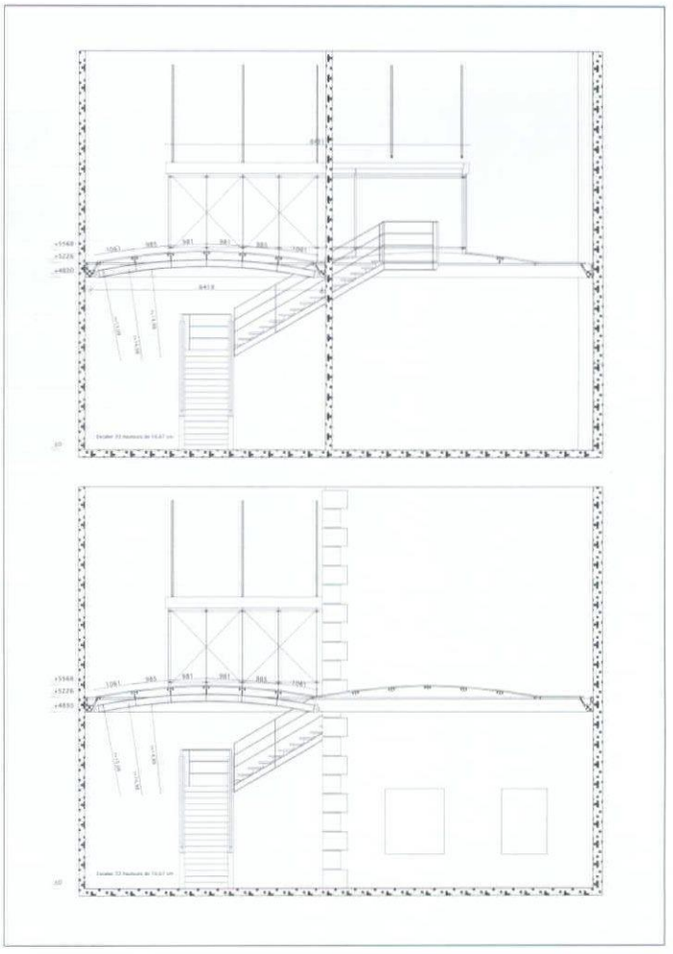
Solar protection in the central atrium is provided both by an external shading device and by a series of internal fabric sails suspended from the glazed roof. Here, RPP undertook a detailed daylighting analysis to examine the effectiveness of this shading, particularly in relation to protecting the adjacent offices from direct solar gain at all levels. At the same time, an air flow analysis using CFD techniques was undertaken and a dynamic thermal model constructed to examine atrium and office comfort condtions.

The daylighting analysis was produced via the Radiance software package, which uses a ray tracing technique to accurately predict solar penetration throughout a space and takes into account a wide range of factors including glass and fabric light transmission properties, and surface texture and reflections. Choosing a summer day, RPP were able to chart the solar patterns at hourly intervals to produce an overall analysis of natural light conditions within the atrium. This showed that the design of the sails provided good protection against direct solar gain from the ground floor to the fifth floor level. However, the sixth floor offices received direct sunlight up to 1pm and at the same time also suffered from high adjacent atrium air temperture. The result was a recommendation that additional external shading above the atrium roof should be provided. This was optimised in detail using Dynamic Thermal Analysis. **WA**

Architectural imagery

National Choreographic Centre of Montpellier, Languedoc Roussillon





Above left *section showing arched beam and gutter detail against old stone wall.*
Above right *elevations*

The French architectural team of F Lipsky and P Rollet have won the 1996 French architecture "Prix de la première oeuvre" with their design for the new National Choreographic Centre of Montpellier in the Languedoc Roussillon. Located in a former Ursulines convent in the heart of the old southern city, the centre combines the new with the old, bringing a contemporary flavour to this historical urban site.

Although a relatively small project, the architects elected to use two Graphisoft computer programs for the design phase – the ArchiCAD drafting package and Art•lantis 3D architectural imaging software. The combination of the two programs allowed Lipsky and Rollett to design complex items, such as the glazed roof in the internal courtyard, with both speed and accuracy.

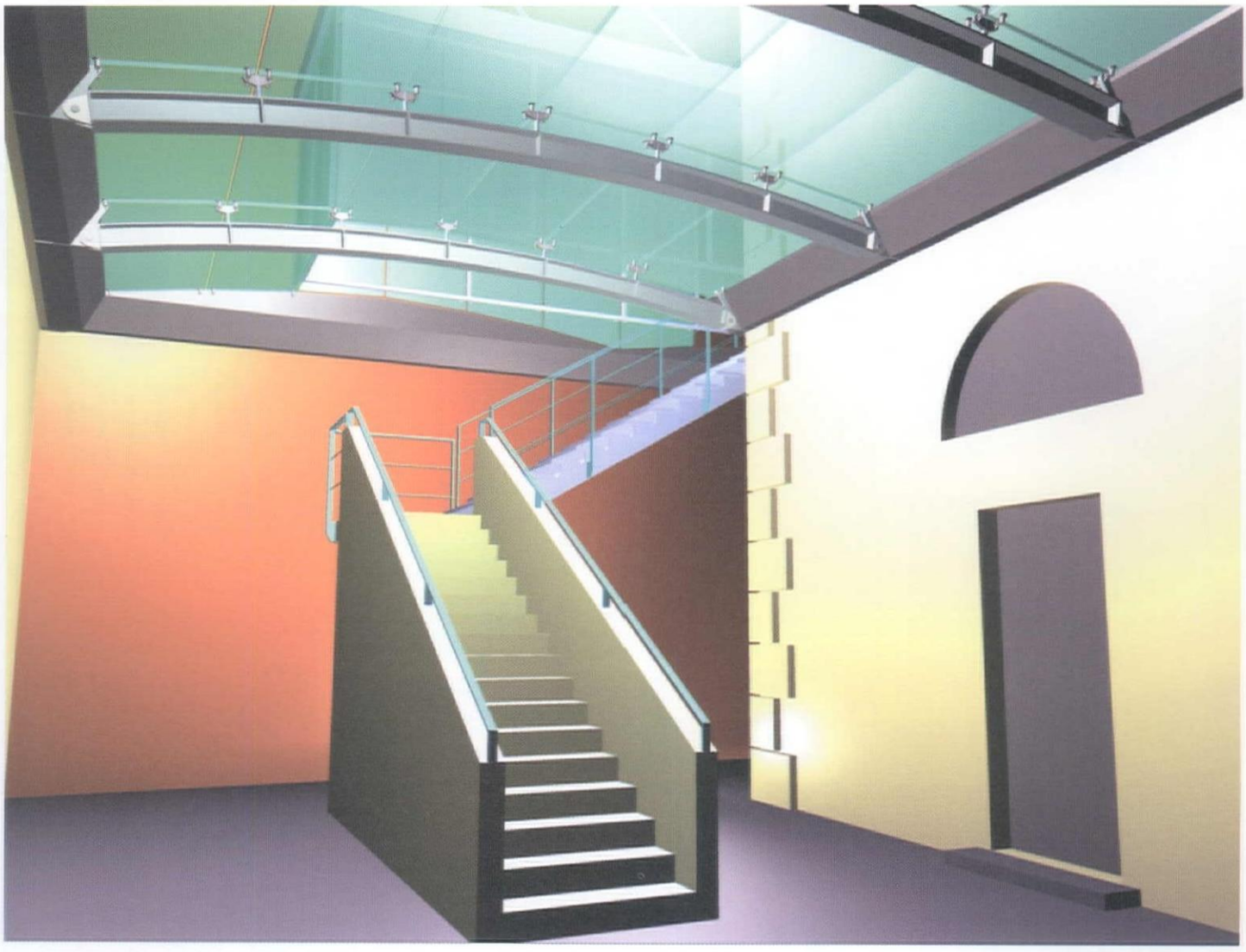
The roof is constructed of a series of one metre by two metre glass panes supported by five arched beams which span from wall to wall. At the edges, the architects have placed a smooth metal beam which acts both as a support and a gutter.

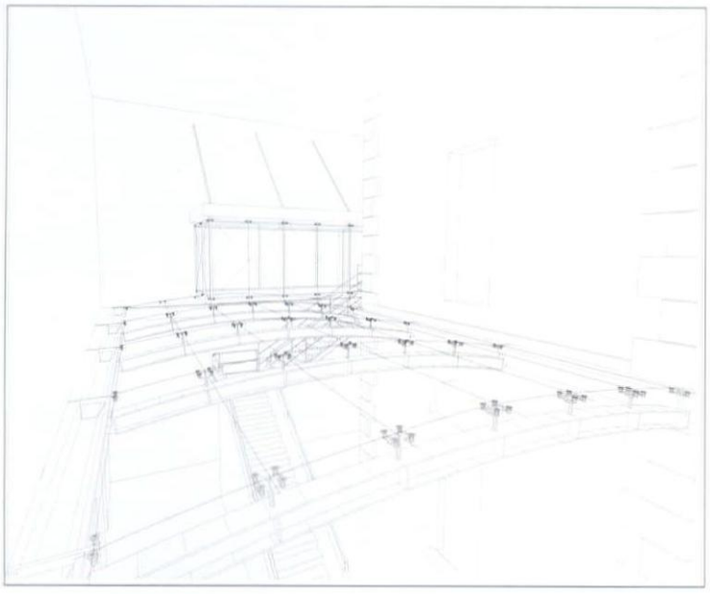
Each constructive element was first created as a library object and then assembled onto the drawings to build up a global file in which ArchiCAD can simultaneously view elevations, sections, plans and perspectives together with the quantitative control elements.

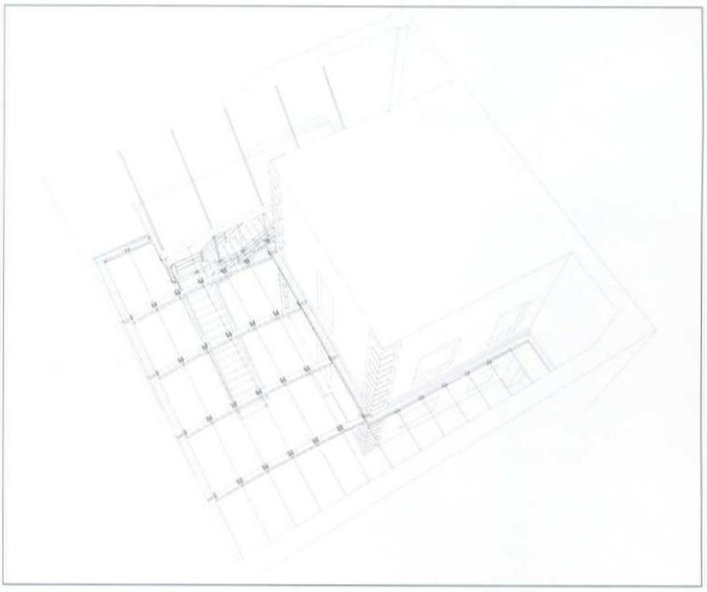
In addition to being able to automatically generate movies in Quicktime VR (Apple virtual reality technology), ArchiCAD also has the power to simulate projects using its integrator capacity, Art.lantis Render. This technology was employed to visualise the contemporary roof construction which abuts the original yellow stone walls of the Ursulines building. Although ArchiCAD could put together the geometric perspectives, what it could not do without Art•lantis was render the colouration and reflection from the glass panes onto the metallic frames and surrounding surfaces. It also allowed the architects to determine the effects of any change in either the reflection or the grain of the different materials. **WA**

Architect F Lipsky and P Rollet
Software ArchiCAD, Art.lantis

Below *Art.lantis Render was used to visualise the design of the new courtyard roof against the old yellow stone of the original building, and to determine light reflections from the glazed roof.* ***Bottom left*** *Detail of courtyard roof.* ***Bottom right*** *Geometric perspective*







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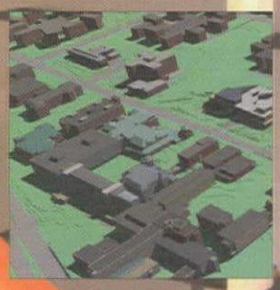
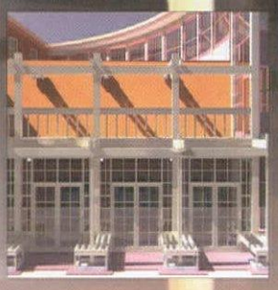
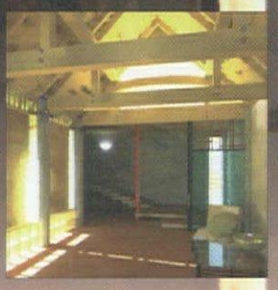
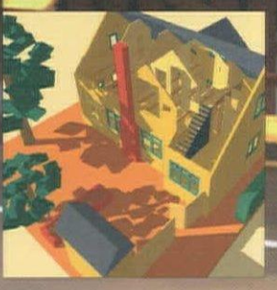

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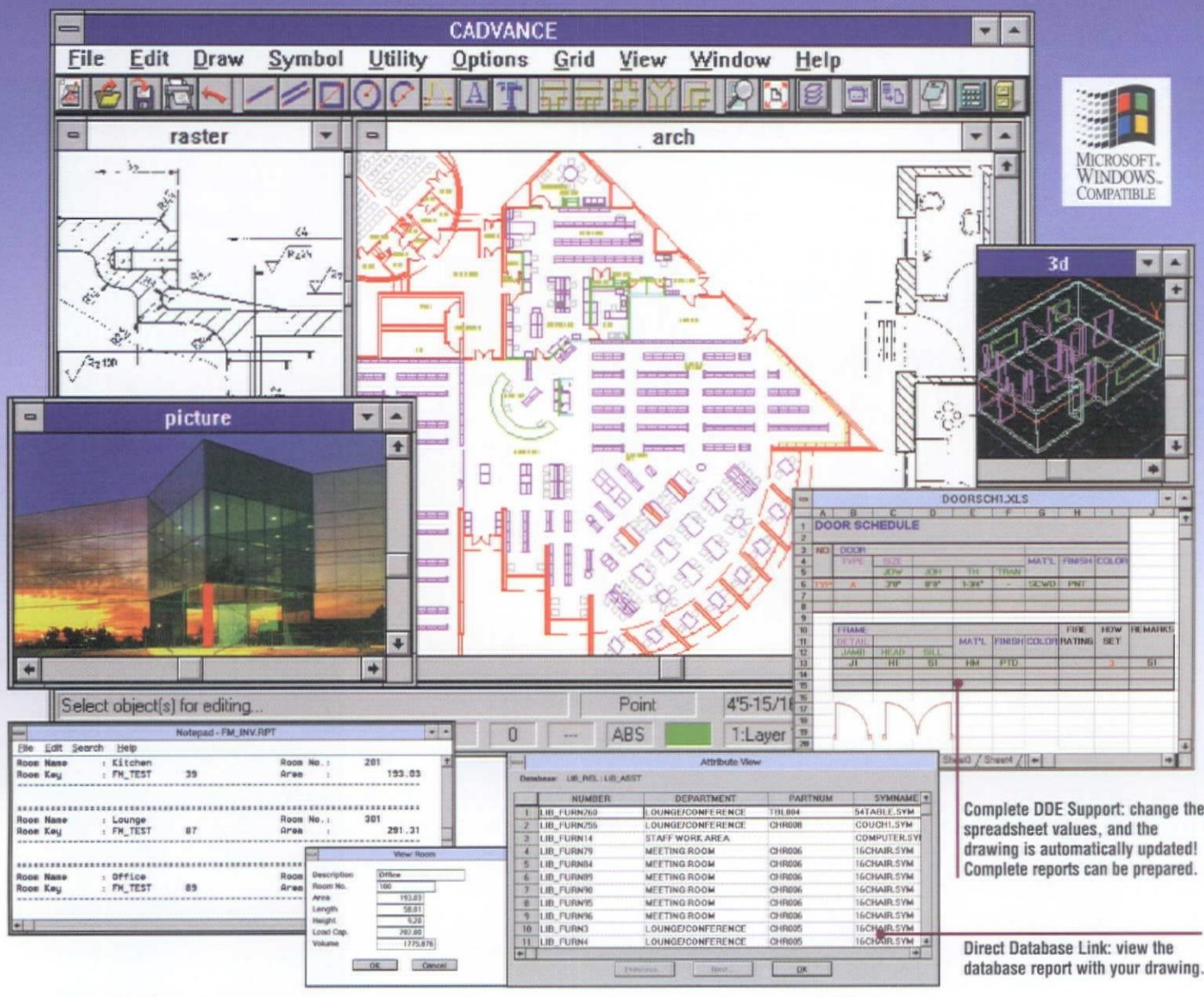

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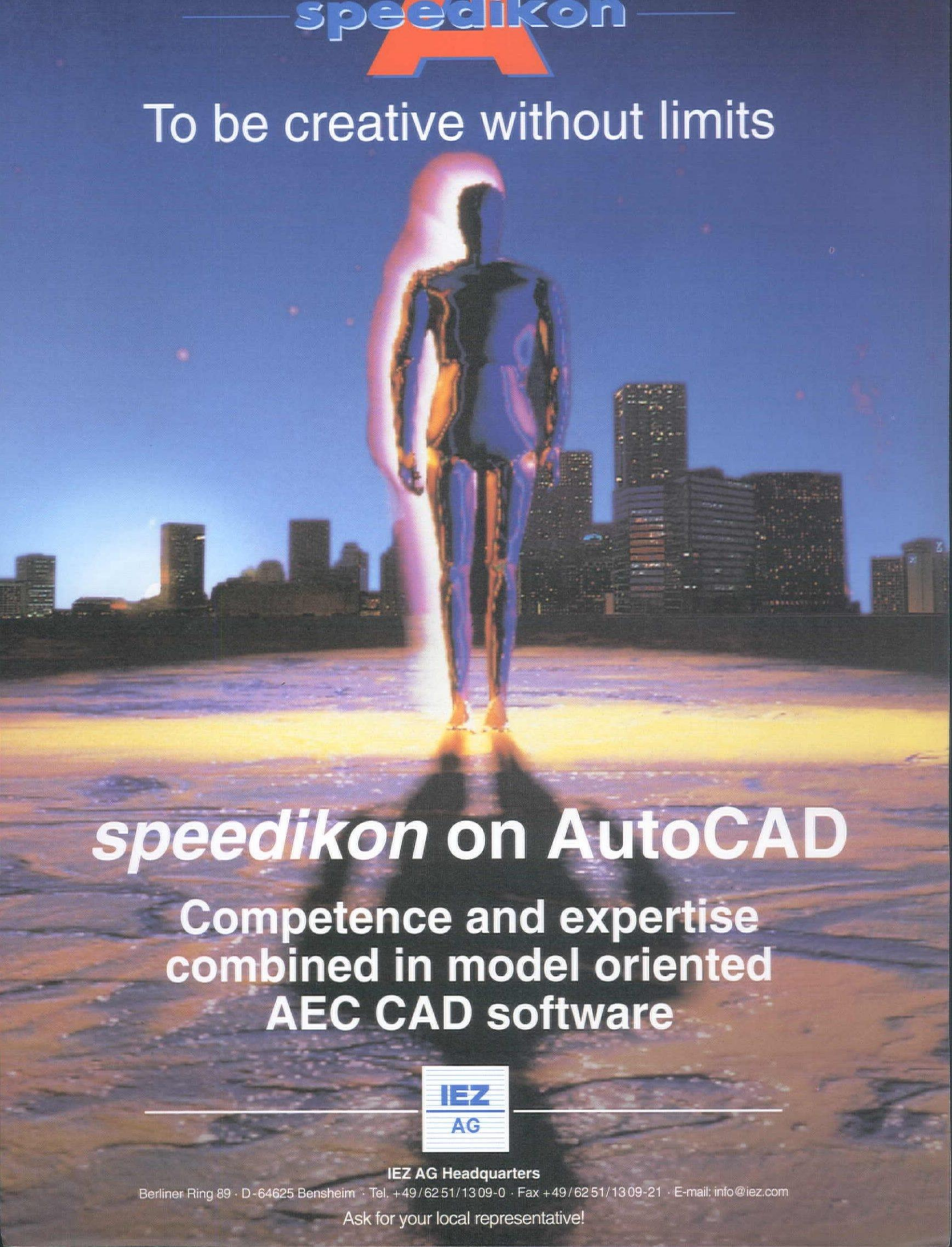
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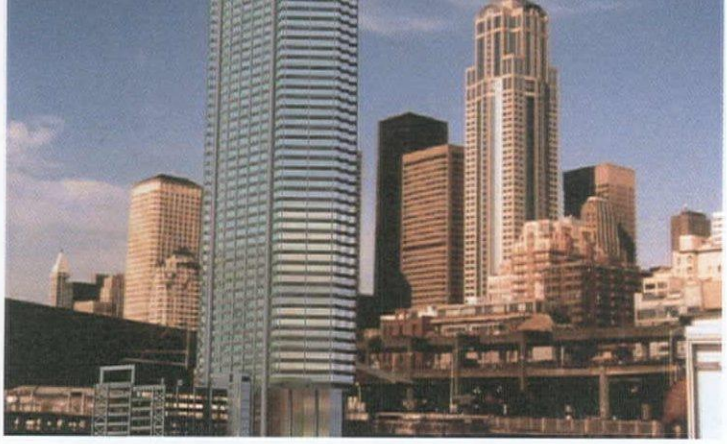

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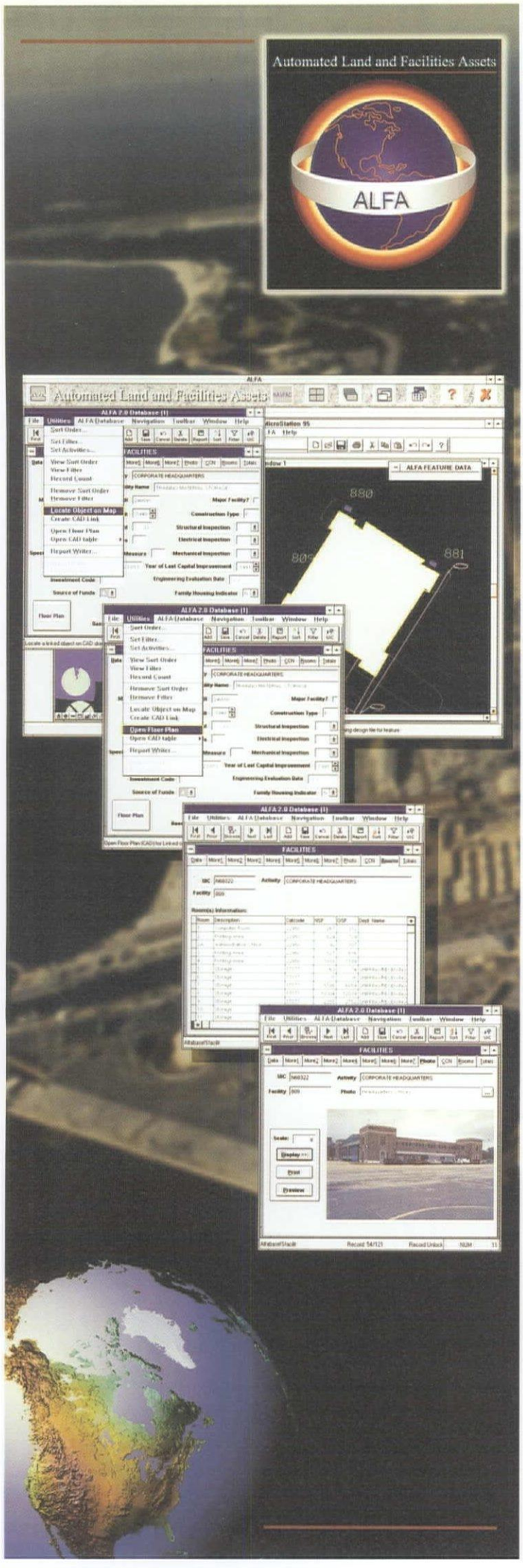

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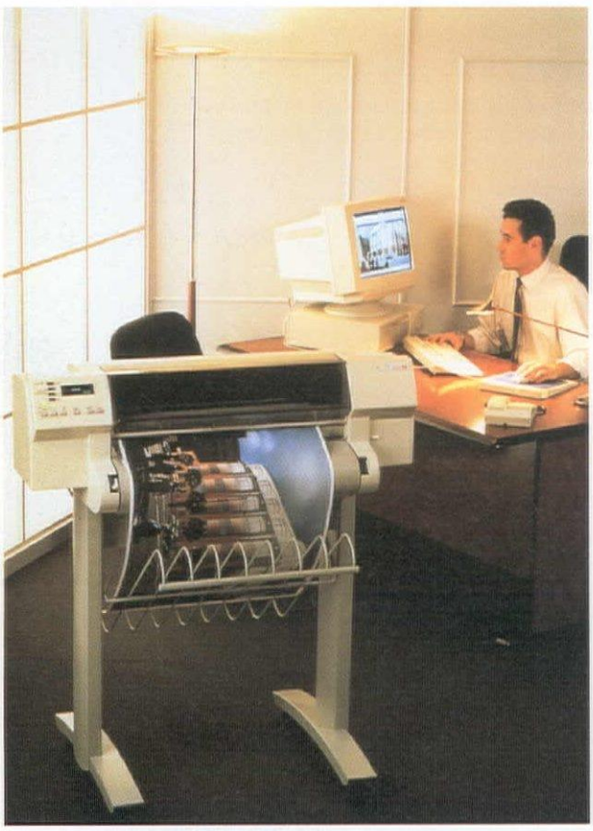

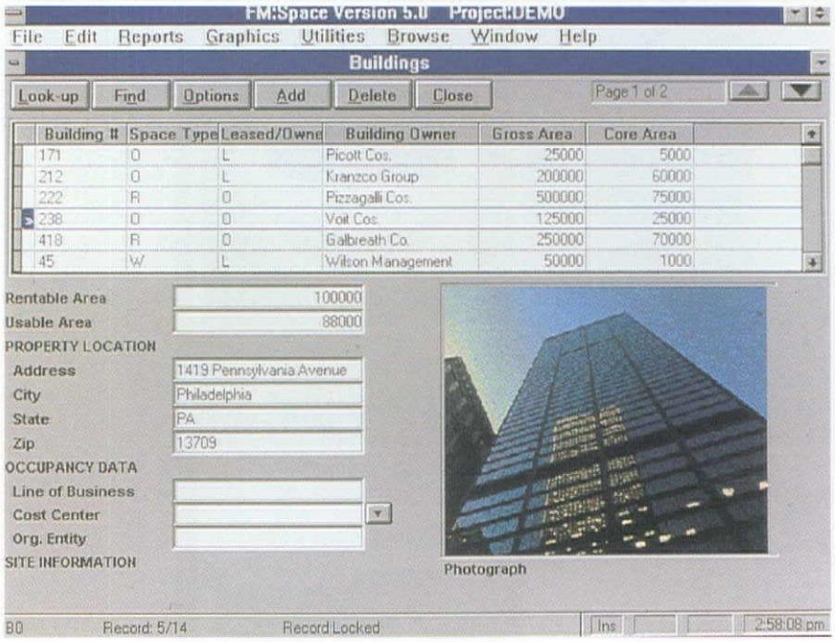

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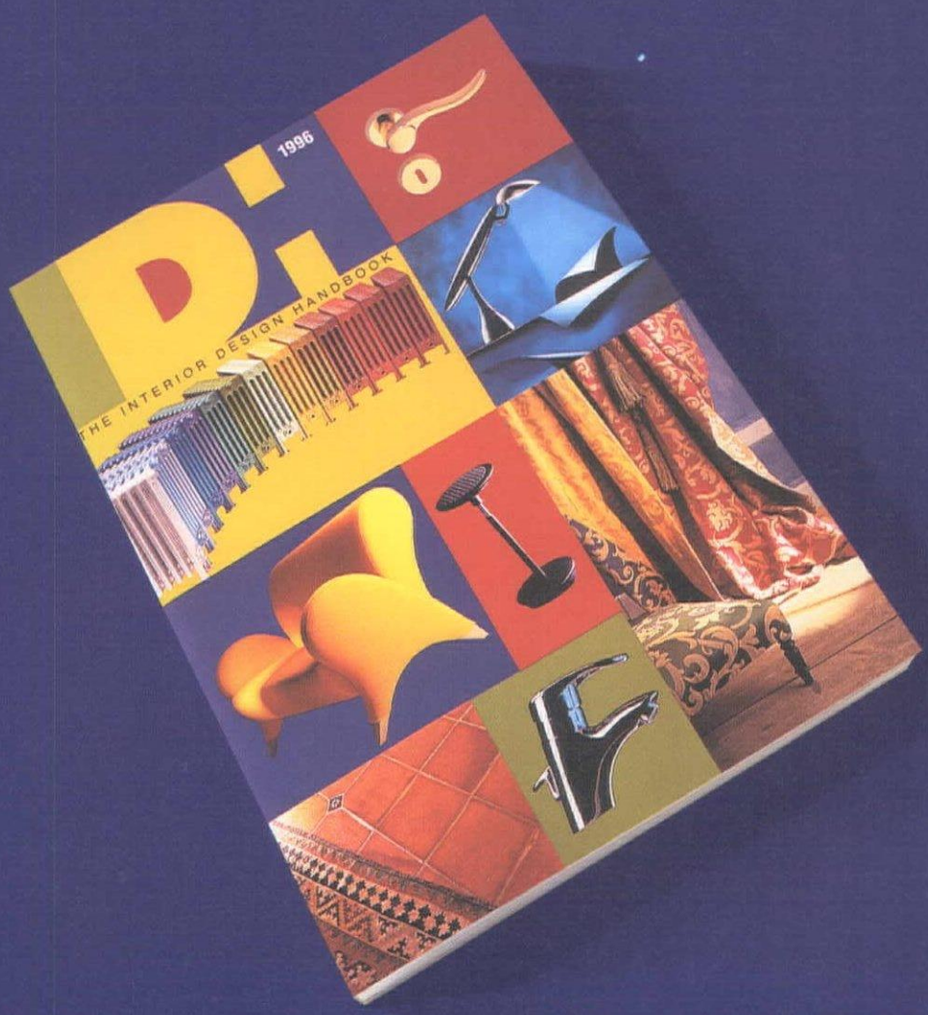

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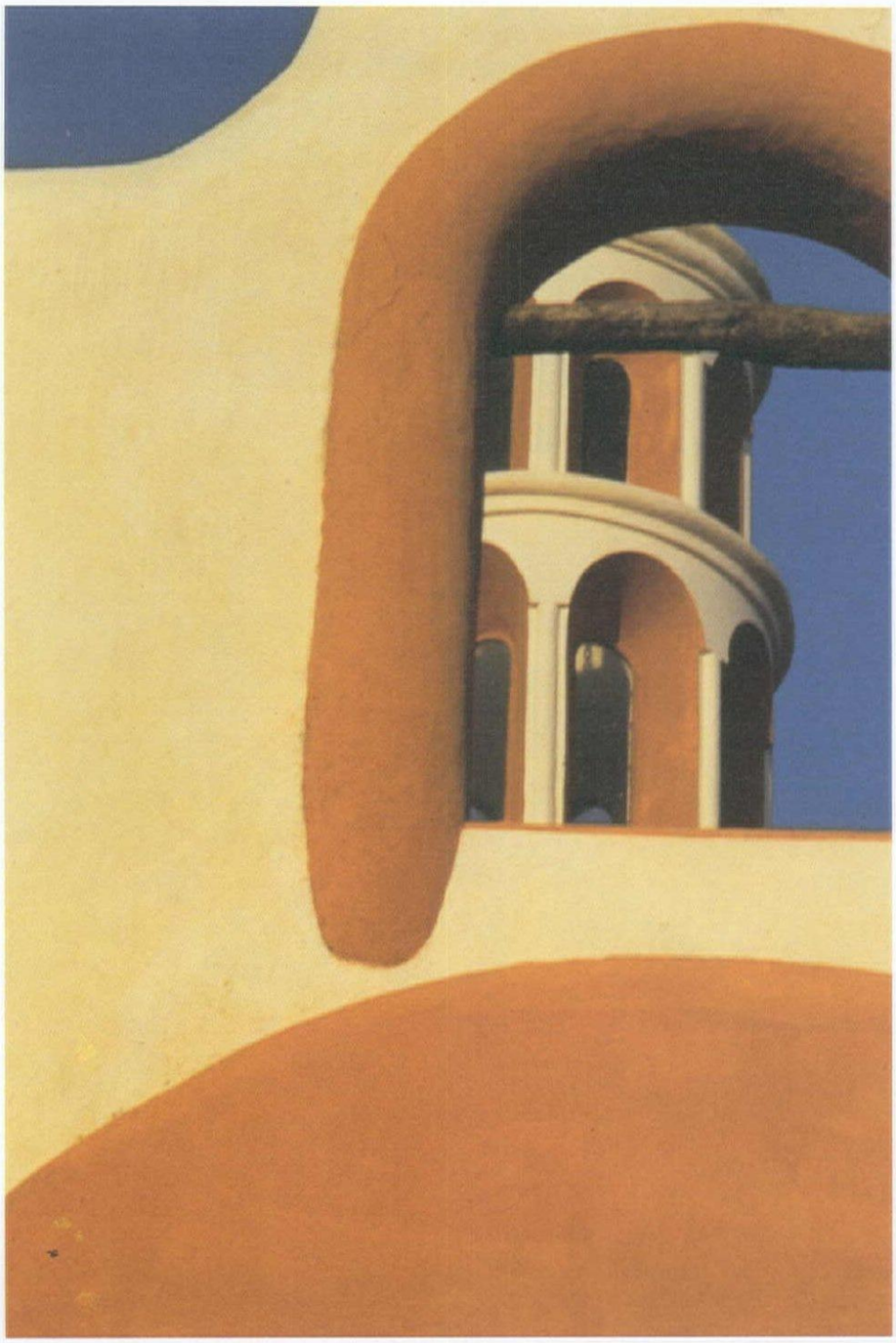

A

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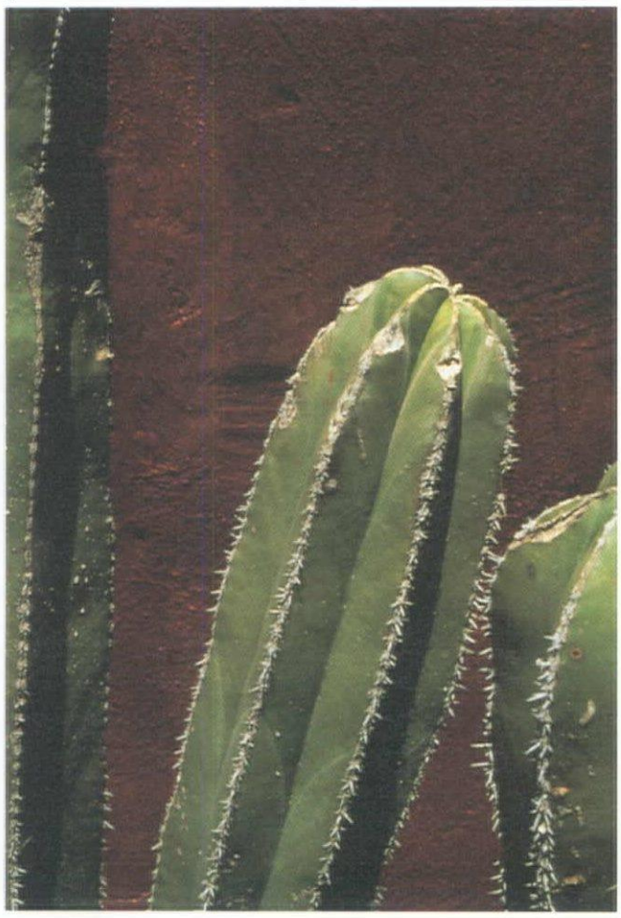

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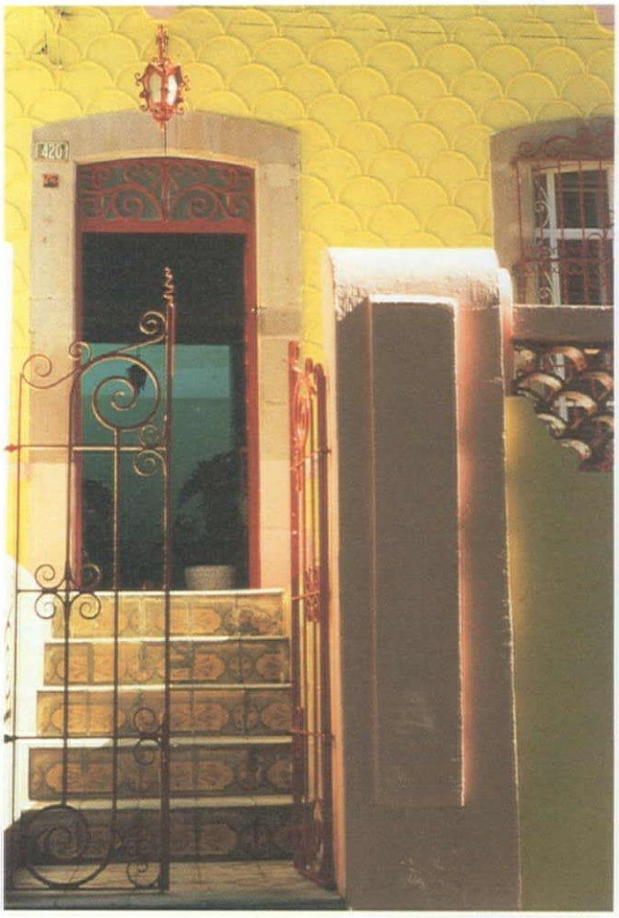

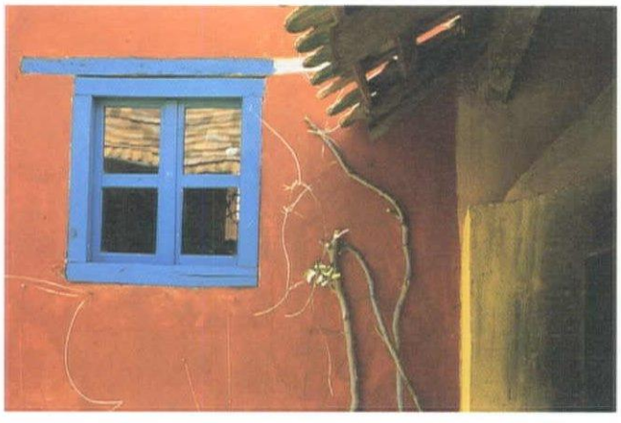

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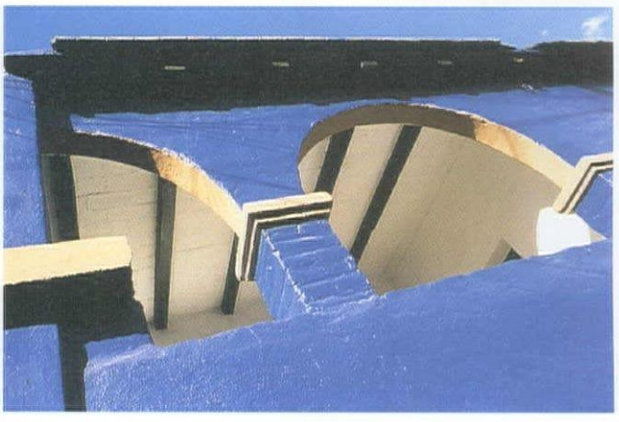

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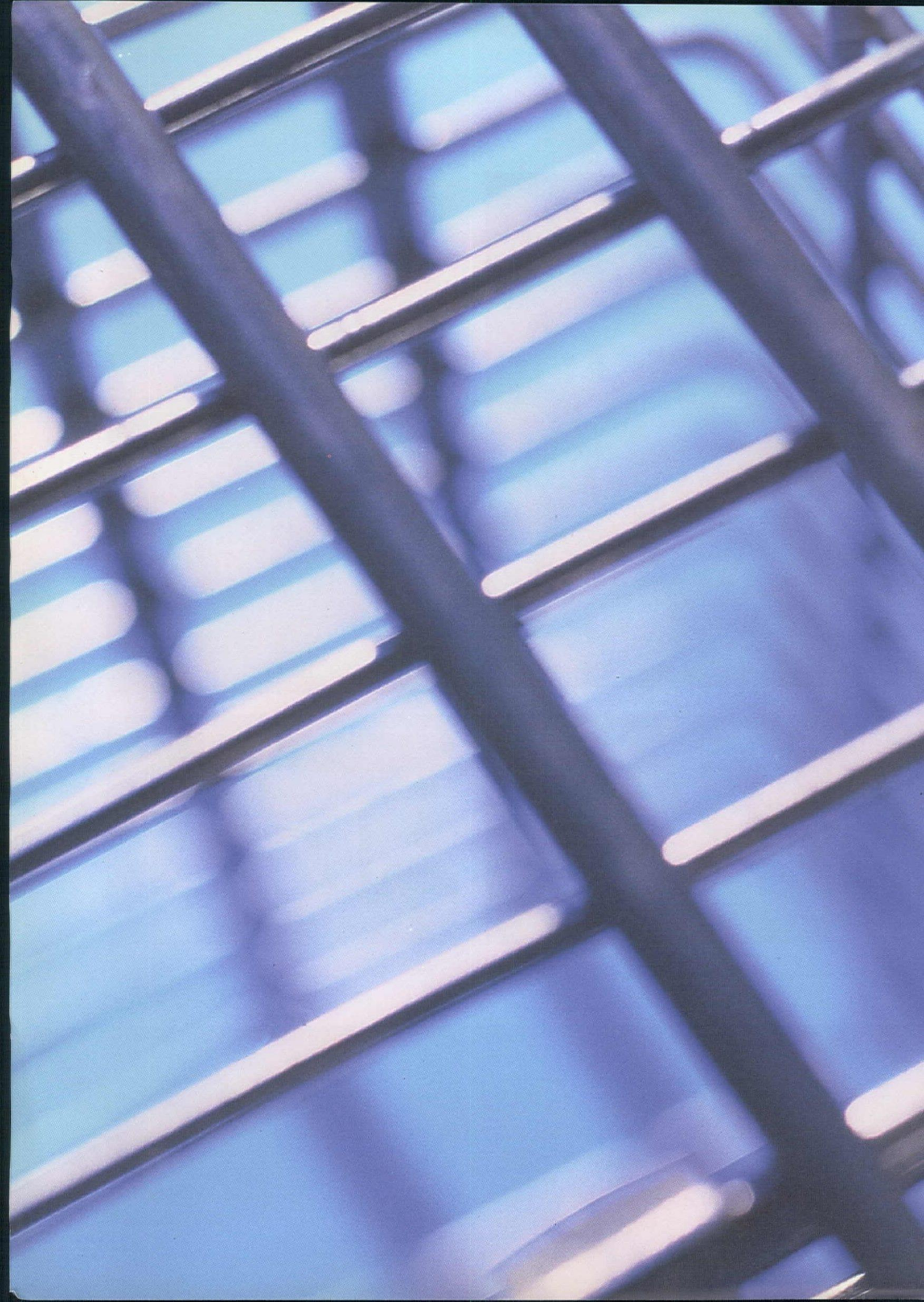


Retail Centres from around the World and their Architects

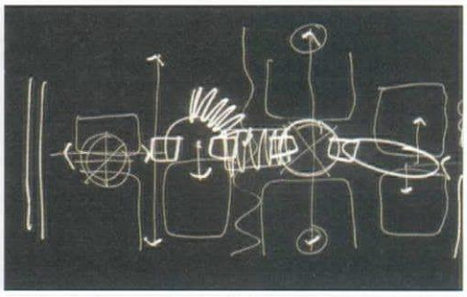
Many of the most influential architectural practices in the world specialise in the design and development of shopping centres.

But who are the truly great practitioners? And which are the shopping centres that prove it?

Phipps Plaza, Atlanta, USA.

In this first World Architecture Special Report, we've brought together those few rare developments that represent the absolute pinnacle of architectural achievement in the field.

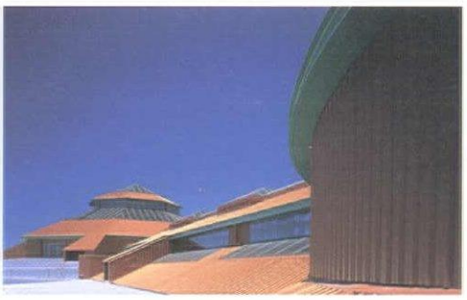
The developments themselves traverse the globe. We visit such places as Beijing in China and Selangor in Malaysia, as well as the USA, UK, Australia and Germany.



Downtown Plaza, Sacramento, USA.

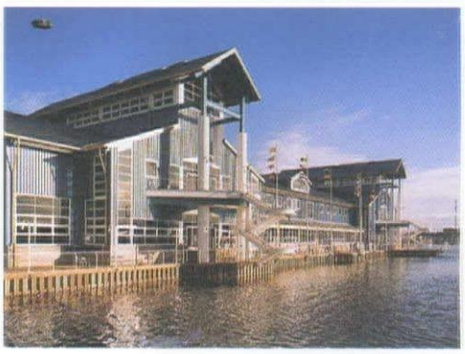
Along the way, we talk to the various architects and developers involved. We hear of the problems they faced, and the often astounding solutions that would propel their developments to the top of the world league.

Throughout, we place these significant achievements in context, with reports on the history of shopping centres, current international trends and costs, and an exclusive interview with Rodney Fitch on retailing worldwide. Hugh Pearman reviews the history of large scale retailing, and John McCloud looks to the future.



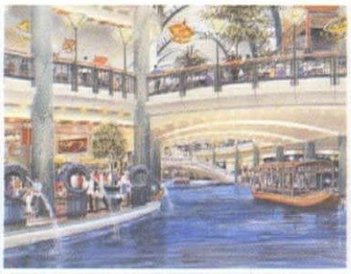
Galleria Morley, Perth, Western Australia.

The World Architecture Special Report on Shopping Centres is a unique, inspirational and absolutely essential study. For your copy, call or write to Elisabeth Conway at *World Architecture*, 3-6 Kenrick Place, London W1H 3FF, UK enclosing a cheque for £25.00. Tel +44 (0)171 470 7000. Fax +44 (0)171 470 7007



Lakeside, Thurrock, UK

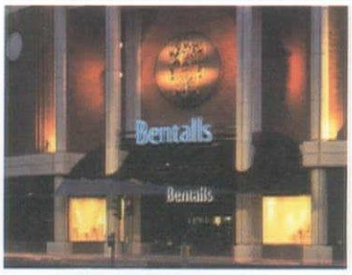
Shopping trolley photograph, opposite, by Robert Clifford.



The Mines, Selangor, Malaysia.

Sun Dong An Plaza, Beijing, China.

Centro Park, Oberhausen, Germany.



Bentalls, Kingston-Upon-Thames, UK.

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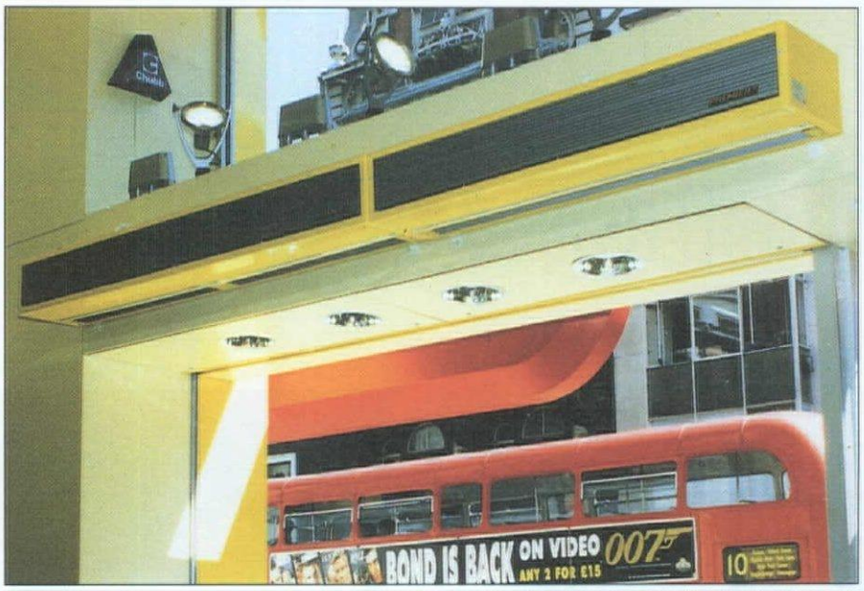

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