WORLD ARCHITECTURE

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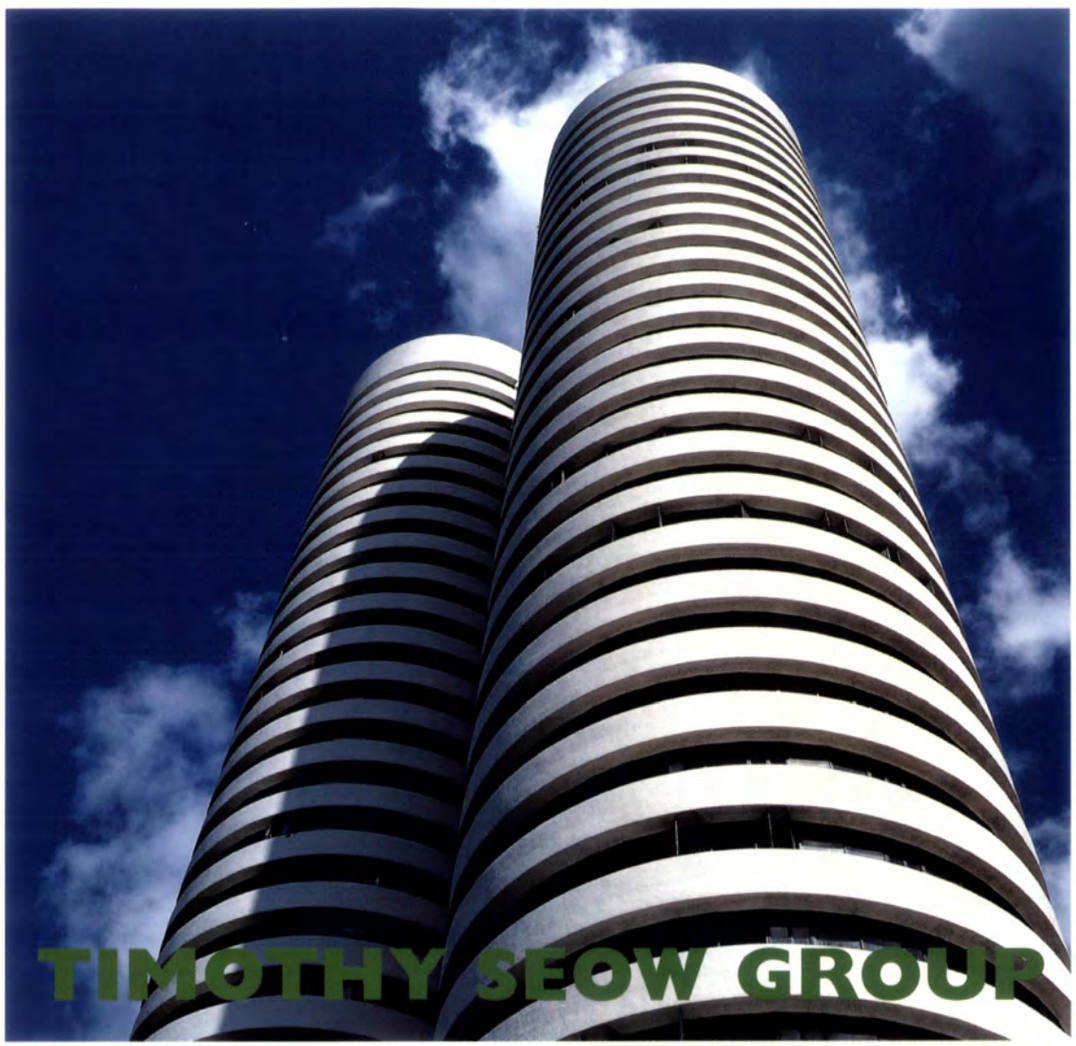

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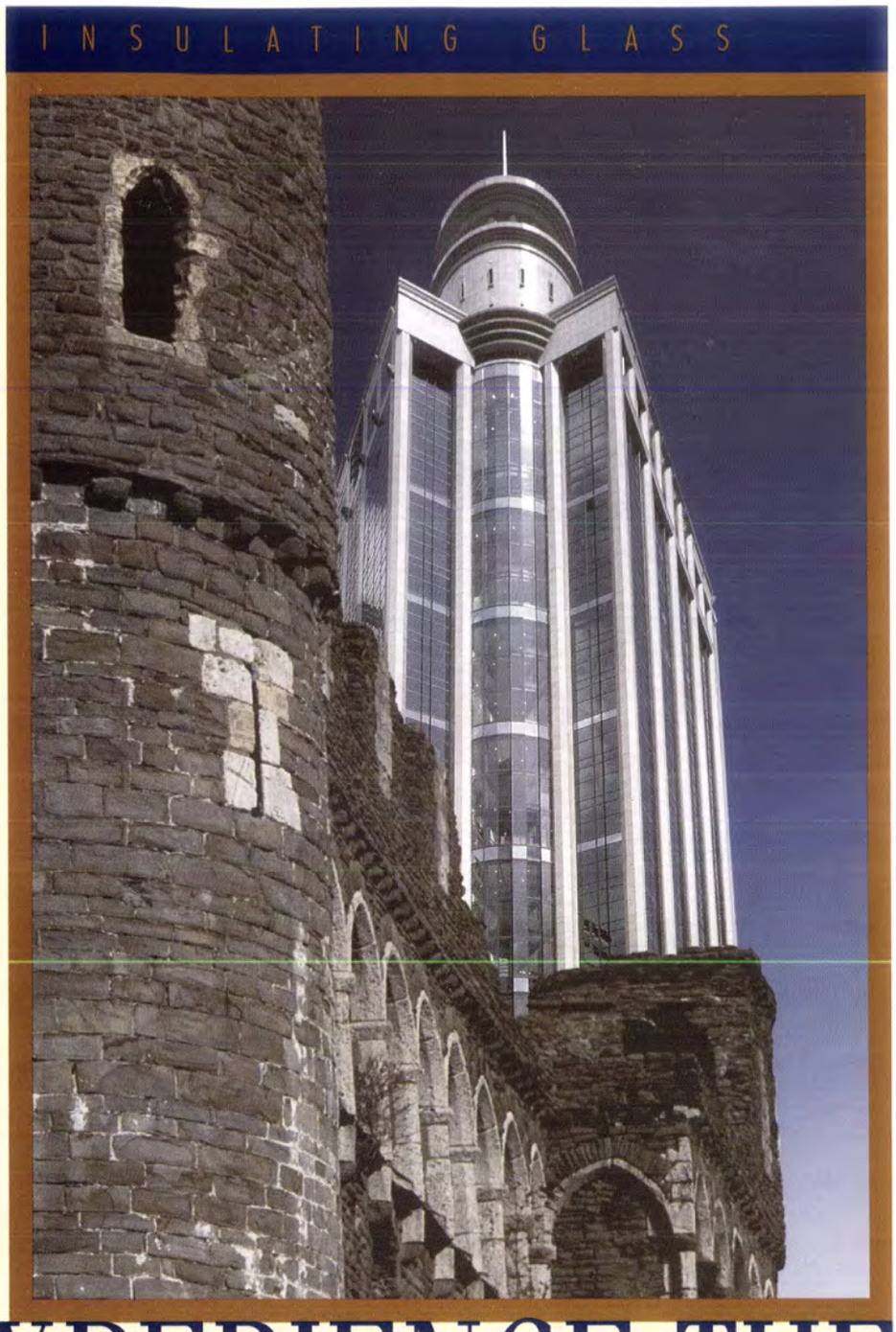

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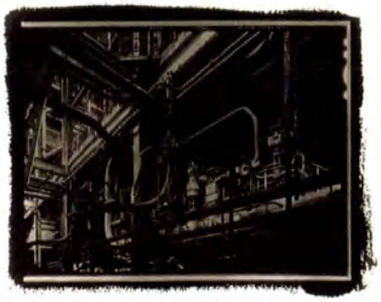

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Flipper. Design Luciano Pagani, Angelo Perversi.

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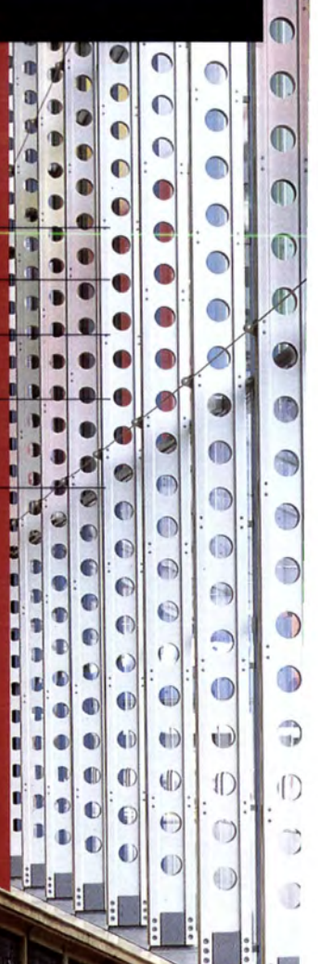
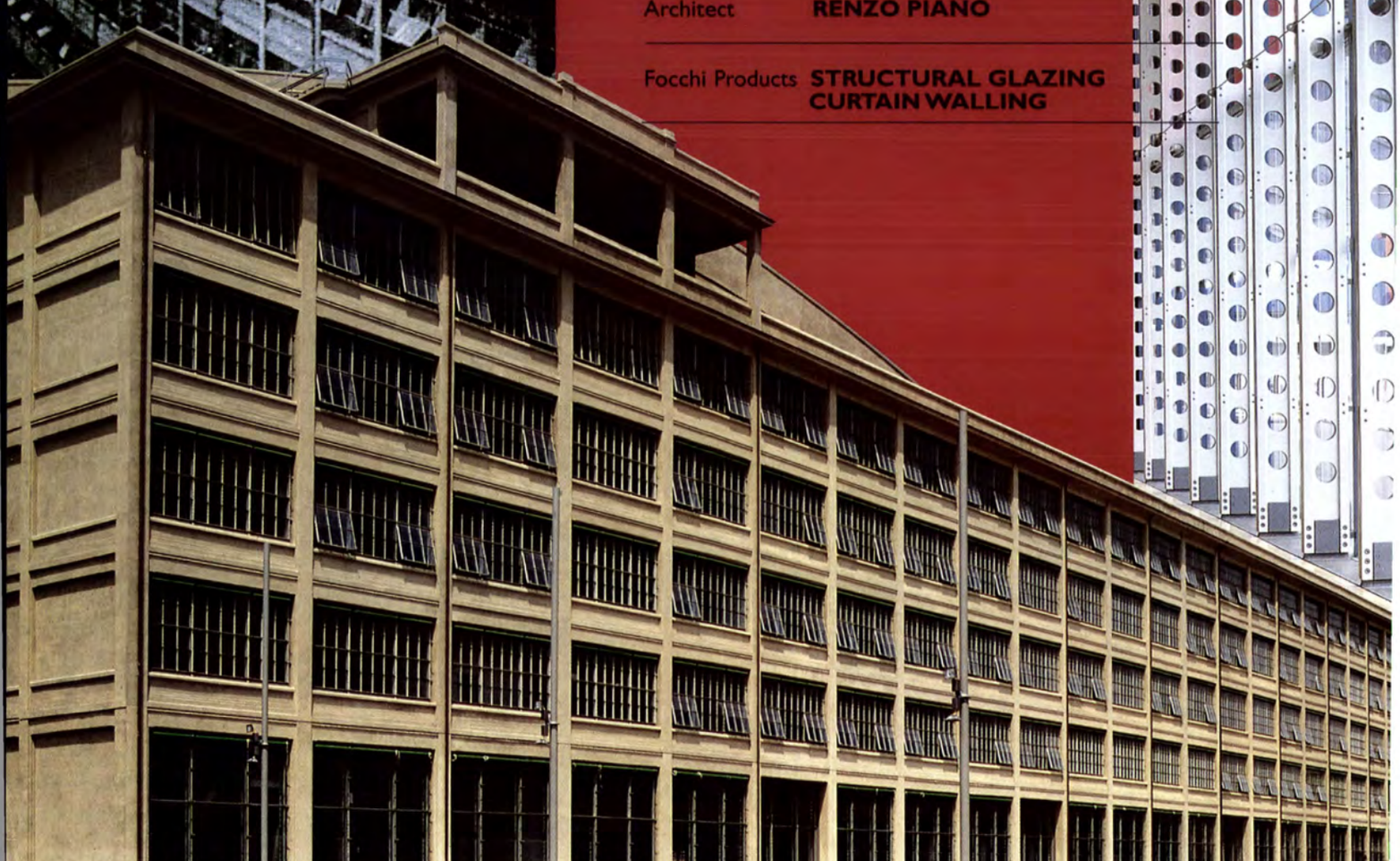
ITALIA

Project	**LINGOTTO**
Location	**TORINO**
Architect	**RENZO PIANO**
Focchi Products	**STRUCTURAL GLAZING** **CURTAIN WALLING**





Forbo Krommenie

Hospitals and healthcare institutions come with their own set of special requirements and any new design scheme, whether it be a refurbishment or new-build project, must comply with strict legislation and technical standards.

Hospitals are renowned for heavy foot traffic and unwelcome spillages, and the choice of flooring has its own set of stringent performance criteria with prime concerns being safety, hygiene and maintenance. The Marmoleum® and Artoleum® ranges of linoleum flooring from Forbo Krommenie not only meet these demands but also provide the client with an attractive, long-life product that is eco-friendly. This is particularly good news for the specifier, who over the last decade has become increasingly aware of the environment and taken care to specify materials from renewable or sustainable sources and those predominantly made of natural raw materials such as stone, sisal, parquetry and linoleum.

The main ingredient in linoleum is linseed oil, which comes from the seeds of the flax plant and has given its name to the final product – linum translating into flax and oleum into oil. The linseed oil is first oxidised and mixed with rosins to form a binding agent or so called cement. Other raw materials are then added – wood flour from the forests of Northern Europe, cork flour from Portugal, ground limestone and non-suspected pigments. This mixture is calendered under high pressure on to webbed backing sheets made from a spun yarn of jute fibres, and then hung in large drying rooms to develop the correct resilience and quality for use. The combination of natural ingredients and the complex manufacturing process results in a resilient and flexible flooring product which is easy to install, use and clean.

Forbo Krommenie is the world's largest manufacturer of linoleum, exporting worldwide. It's Marmoleum flooring range is part of a complete system and is recommended for healthcare applications. Using the company's Marmoweld welding cord, it can be laid as a smooth, continuous surface thus avoiding the accumulation of bacteria and dirt in the seams. Where high standards of sanitary conditions are required, Marmoform coved skirtings and inner- and outer-corners can be supplied for watertight, hygienic floor-wall connections. Marmoleum is easy to look after and can be cleaned without the quantities of chemical products or disinfectant commonly used. Dry cleaning is recommended, as opposed to wet, to prevent the growth of micro-organisms.

Other advantages to the healthcare environment include permanent anti-static properties, fire and cigarette burn resistance and a smooth, non-porous surface. It is easy to keep dust free, is naturally bactericidal, non-allergenic and has a homogeneous construction, making it highly durable and able to withstand heavy loads and wheeled traffic such as hospital beds and mobile equipment. And the range has huge decorative potential.

The complete Marmoleum system offers various patterns and over 60 different colours from midnight blue and emerald green to terracotta and saffron yellow. It is manufactured in varying grades and thicknesses, in accordance with the strict requirements laid down in the ISO-9001 standard. Within the system, both the marbled structure of Marmoleum Real and the subtler, multi-coloured patterning of Marmoleum Fresco are highly suitable for healthcare use with good dirt-concealing properties. Both these ranges can be combined with complementary colours from the Plain Linoleum Walton catalogue.

Traditionally the chequer-board or patchwork effect was the simplest way to add a bit of interest to the floor, but with the increasing sophistication of new technology, bespoke designs have become more fashionable. Forbo Krommenie has kept up with this trend with the introduction of it's Aqua-jet computer-controlled cutting technique. This system produces detailed precision-cut insets for seamless installation into the floor area. For hospital and healthcare institutions, this service offers endless possibilities from simple geometric designs to define corridors and wards, to the creation of cartoon characters to liven up the children's ward.

However, Forbo Krommenie do more than just supply the floor covering. They are equally concerned about professional installation and floor care and as such provide technical advice and a back up service to both specifiers and installers. The company's brochures not only gives information on the products but also includes detailed instructions for subfloor preparation, use of adhesive, scribing, cutting and welding with additional information on efficient floor care. Marmoleum® is truly a complete system.

For more information on Marmoleum, Artoleum or any of the Forbo products please tick box no. 8 on the reader reply card or contact:

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Colour and Architecture

by Dr. Jürging of RAL

In architecture, the colour design is normally subordinate to the spatial design. In many cases the theme of "Colour" has no role to play. The foundation of this unsatisfactory state of affairs can usually be traced back to universities, where colour design rarely finds a place on the curriculum.

But once a person has actually seen the effects that a different colour scheme can have on one and the same building, then the conclusion that the colour design is a vital component of the overall design is inescapable. Otherwise, the architect is simply abdicating the role of specifying a building's character to someone else.

Moreover, the three-dimensional structure of a building can be emphasised using different colours; or – to put it another way – a monochromic building simply looks "flatter". In other words, it is possible for colours to affect our perception of space. In order to bring colour into planning from the start, it is important to be aware of the effects different colours and colour combinations can have on spatial form. Of course, here we can only offer a few basic pointers and guidelines: interested readers are referred to the specialist literature on the subject.

Colour

In principle, it is impossible to talk about a subjective sensory phenomenon such as colour. However, in our society, where communication plays such a vital role, we need to be able to communicate information concerning colour as unambiguously as possible. The number of humanly distinguishable colours has been estimated at almost 10 million. To obtain an overview of this diversity, it is necessary to establish certain ordering criteria. Fundamentally, we distinguish between individual hues – that is red, blue, yellow, green, orange or violet. These can then be divided up according to their individual lightness and chroma values.

Three values are therefore necessary in order to adequately define a colour. As a consequence, it is impossible to logically order all colours in a plane. Instead, a three-dimensional space is required if every possible colour is to be assigned to a particular point within this "colour space".

The most comprehensible description of such a "colour point" makes use of cylindrical co-ordinates. The basis for this system is the colour circle, within which every hue corresponds to a certain angle. The position on the vertical axis (grey axis) corresponds to the lightness of the colour, which increases from the bottom (absolute black) to the top (absolute white). The chroma of a colour increases with the distance from the grey axis. The position of this chroma line is determined by the hue (angle). The RAL Design System is based on this principle. The Color Atlas represents the entire colour space available to the architect in the form of selected colour samples. The designations of the colours give both their locations within the atlas and within the colour space. The colour space forming the base of the RAL Design System is widely used in colour science and colourimetry, so that the RAL Design System is suitable as a common basis for all areas related to colour.

Light

Without the presence of light, it would be impossible to recognise and distinguish colours. Moreover, the appearance of a colour is dependent on the type of light. Consequently, it is advisable to carry out colour selection under the light in which the colours will subsequently be displayed.

This is particularly important when different parts with the same colour are to be combined. The reason: the colours are usually not identical, but just "conditionally identical" – i.e., although two objects may appear identically coloured under a particular type of lighting, under a change of lighting they appear different (metamerism).

Colour selection

It is thus important to study the coloration of the surroundings and to match the colour selection to this "colour selection" – particularly in architecture.

The RAL Design System can be used to determine the existing colours. A colour sample collection then helps with the colour analysis – establishing the relationships between the existing colours. Thanks to the RAL Design System codings, variations in hue, lightness or chroma are easy to determine. The colours to be combined can then be selected on the basis of deliberate colour contrasts. Matters such as the meaning and function of the building as well as its relationship to its surroundings need to be considered here. A building can be brought to the fore, pushed in to the background, or aligned with the adjacent buildings by the application of different colour schemes.

In this context, it is important to realise that differences in lightness are more noticeable than differences in hue.

Differences in materials, structures, and functions can also be highlighted or toned down.

Contrasts

The contrast between hues must occupy first place here, as such contrasts are always indispensable. Although combinations of "shade in shade" appear harmonious, they are ultimately boring – lacking the bite of opposites.

Hue contrast emphasises the difference between parts, a chroma difference can express an order of precedence, whilst lightness contrasts can ultimately serve to reveal different spatial depths.

Hue contrast does not necessarily mean a combination of opposite colours – pure hue contrast is simply a variation of the hue while retaining the lightness and chroma. The wider the separation between the colours, however, the greater the tension created (special case: warm-cold contrast).

But things really start to get interesting with the simultaneous variation of several colour properties. For example, consider a colour series in which increasing lightness is accompanied by a shift in hue. Here, given that the hue can move around the colour circle in two different directions, there are two fundamental possibilities. The resulting colour series can either follow the natural lightness variation of the colours, or go against it. Yellow is the colour with the greatest lightness, blue the colour with the lowest. This natural lightness reveals itself in paint manufacture, in that the colours with the highest chroma can only be achieved for a particular, hue-specific lightness.

Naturally, colour combinations can also be made on a purely intuitive basis. However, awareness of certain effects in the interplay of colours enables a more direct approach and the more rapid attainment of a usable result.

The RAL Design System

However, one thing should be clear: the RAL Design System does not provide a set of instructions for colour design. The responsibility for this task lies firmly with the architect. Happily, the RAL Design System is available as a tool, helping him to fulfil this – by no means trivial – task. Remaining with the RAL Design System colour space guarantees that the selected colours can actually be produced, avoiding the production of dead-end designs.

As the hue, lightness and chroma of every colour are known in the RAL Design System, additional colours can be combined with one or more basic colours. These additional colours can harmonise or contrast with one another, as required by the particular circumstances of the individual project.

Since the appearance of the RAL Design System, more and more paint manufacturers have converted to labelling their own colours with the RAL Design System codes. As a consequence, the architect can immediately recognise a colour's place in the colour space of the RAL Design System.

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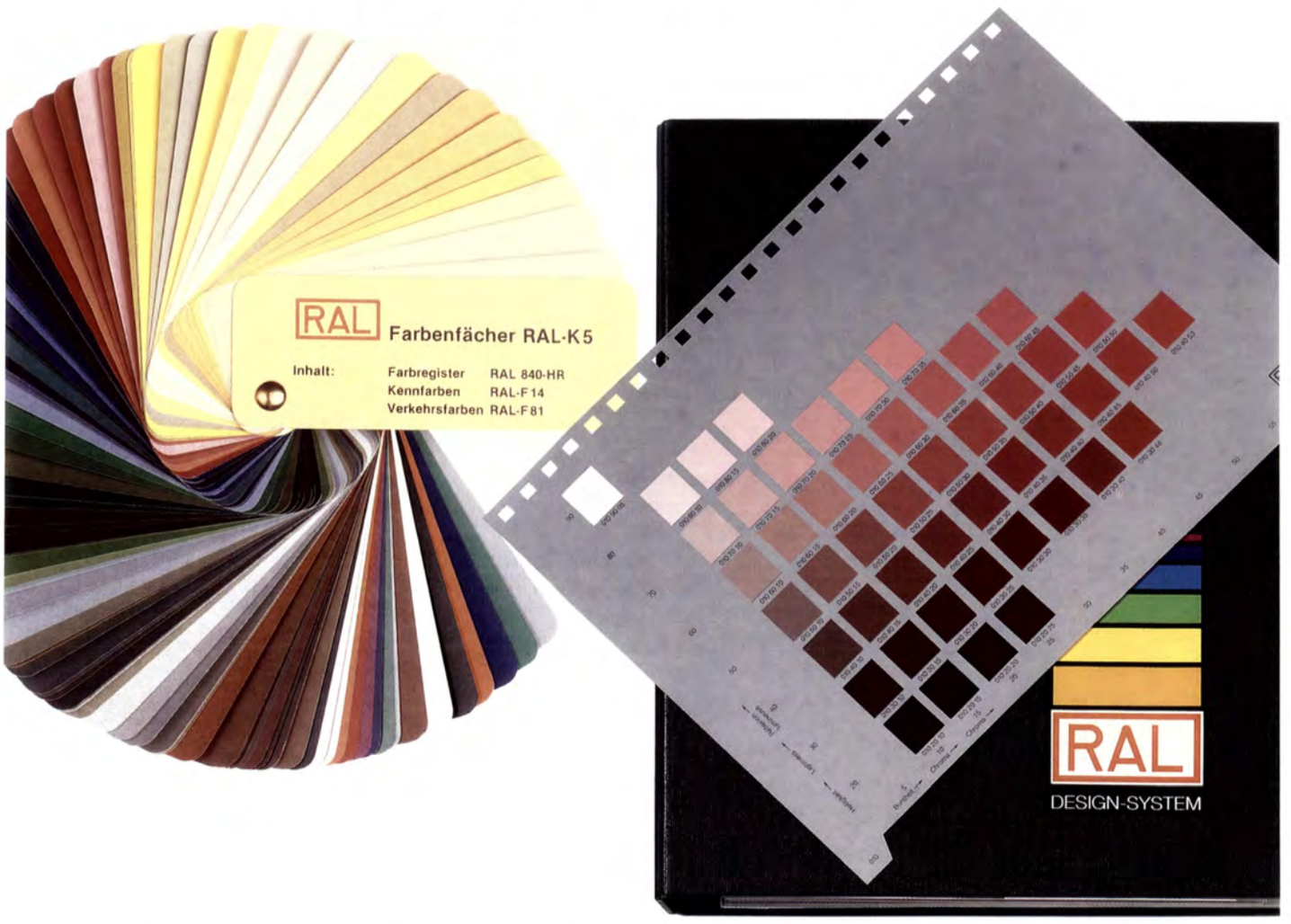

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Renovation of the Haiger Municipal Hall

2250m² of stainless steel strip provides impermeability that lasts

Klaus B. Maier

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

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

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

The renovation work

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

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

The handling

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

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

Testing

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

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

Conclusion

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

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

NIROSTA® is a registered trademark of the Krupp-NIROSTA GmbH

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Flocksdorfstrasse 4
57234 Wilnsdorf-Anzhausen
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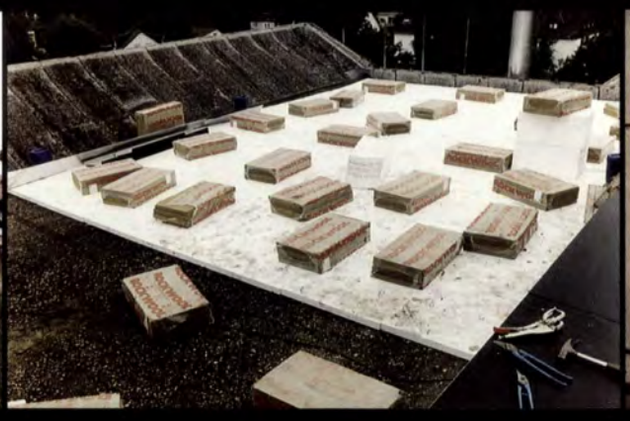
Fax: +49 (0) 2737 500 97/500 80

Project data:

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

1



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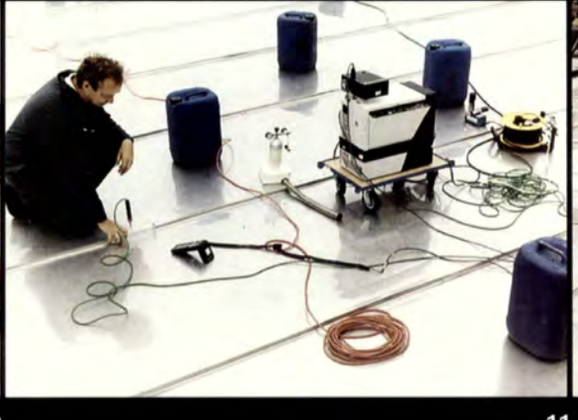

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12

Opposite page

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

This page

1 *The Municipal Hall, built 1973*

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

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

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

5 *Partial view of the municipal hall with hoist*

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

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

8 *Preparations for the Nordrheim-Westfalischen test*

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

10 *The TUV test equipment with its sniffing probe*

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

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

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

13

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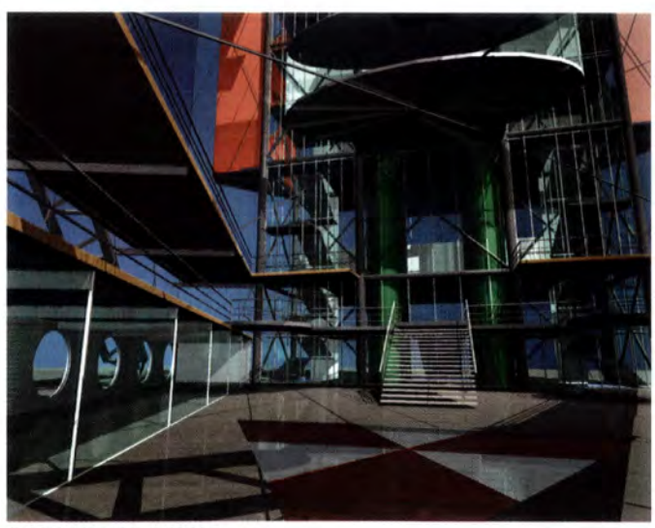

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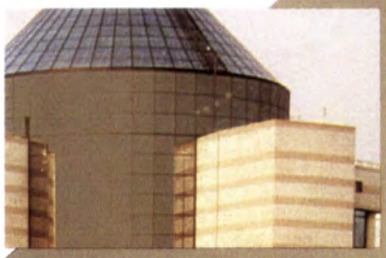

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Fax: + 34 (6) 285 4163

UK:
Fired Earth
Tel: + (44) 1295 812088
Fax: + (44) 1295 810832

The "Celeste" collection of CERAMICA DECORATIVA, a collection of ceramic elements or wall tiles, recaptures the Spanish "cabujon" or "disc" style used in the XIV Century as ornaments for facades. It is presented in three different series with different inserts. The "Agua"series with Maritime elements: fish, starfish, shells... the "Tierra" series with floral elements and the "Aire" series with stars, sun, waning moon, full moon. These series can be adapted to a wide range of products, from the monochrome 15x15cm, or 20x20cm to the larger sizes with fine textures or simple motifs. This collection offers an exciting and different solution to renovate surfaces without changing the tiles.

CERAMICA SALONI

Spain:
Mr. P Reneses
Tel: + 34 (64) 343434
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The "Titanio Piedra" floor tile series in 31x31 and 43x43cm from the "Titanio" collection has a PEI IV resistance to abrasion and Mohs 8 scratch resistance. These technical features have been developed in a textured, rustic product with soft natural colours. Due to its technical properties this product has a wide range of possible uses, from residential to commercial buildings. The non-slip models in three different formats plus the 31x31cm format complete the "Titanio Piedra" series.

CERAMICAS CALAF

Spain:
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Fax: + 34 (3) 639 0514

With a long tradition in the manufacture of rustic tiles, Ceramicas Calaf has developed a system to attain a better finish for rustic floor tiles, the Terracotta Plus. The objective of this system is to avoid the installation problems of terracotta tiles, with a treatment that enhances the finishes, providing them with high resistance to stains and easier maintenance. This system involves three separate treatments and, used accurately, will obtain the best results for rustic tiles.

GRES DE ARAGON

Spain:
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Fax: + 34 78 833003

GRES DE ARAGON's R&D capacity has led to the production of special pieces for architectural use where three dimensional surfaces need to be tiled simultaneously, successfully avoiding the ridges produced by having to cut pieces to measure.

The GRES DE ARAGON catalogue of base and special pieces offers a collection of three basic product lines: natural stoneware, glazed stoneware and the Design and Architecture series. For renovation work the company carries out special designs to suit the needs of each building.

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Spain:
Tel: + 34 64 771560
Fax: + 34 64 771809

UK:
Mr Paul Burke
Tel: + (44) 585 775565
Fax: + (44) 585 548655

With a history of almost one hundred years GAYA FORES started manufacturing the traditional "Andalusin base" wall tiles in 14x28, 15x20 and 20x20cm. Later they began to manufacture stoneware floor tiles in 45x45cm. During 1995 they invested 1.8 billion Ptas in the manufacture of white paste floor tiles in 33.3x33.3 and 40.8x40.8 formats, as well as special pieces. The new floor tile series "Santillana", "Romanica", "Altamira", "Mediterraneo", "Technos", "Urbitec" and "Rioja" in 33.3x33.3 and 40.8x40.8 with high ratings in PEI and Mohs scale are ideal for public areas with high traffic density.

HIJOS DE CIPRIANO CASTELLO ALFONSO,S.L.-EL MOLINO

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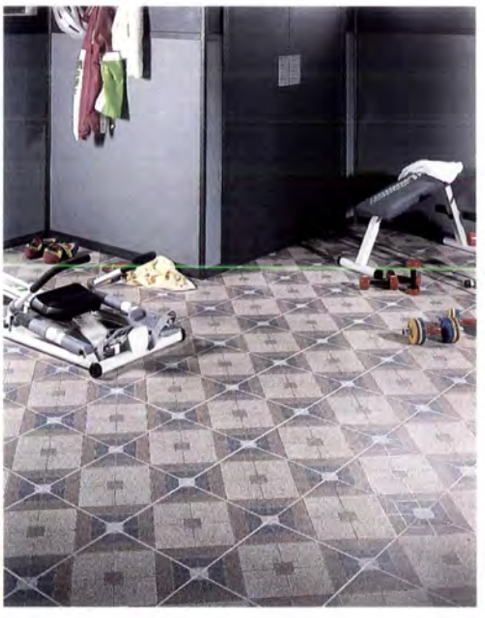
Tel: + 34 64 601166
Fax: + 34 64 600148

UK:
David James & Co
Tel & Fax: + 44 121 501 1168

The floor tile "Laser" presented in 33x33 format is a high hardness floor tile due to the grain in the tile surface which gives a rough aspect to the product. The EL MOLINO non-slip "Laser" series is suitable for surfaces where non-slip coverings are required (kitchens, gymnasiums, industrial areas, etc.). The "Laser" series offers a fine design and a special range of colours.



PORCELANOSA,S.A.

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Mr R Bellmunt
Tel: + 34 64 521262
Fax: + 34 64 527258

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Mr P. Pesudo
Tel: + 44 181 680 1123
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PORCELANOSA has recently launched the "Urbano" series, part of a wide range of products presented in a technical catalogue of ceramic products with colours and enamels of the most advanced technology in single-fired tiles on a white body. This series is a practical floor tile application for areas with high traffic density (Mohs 8-PEI V). Using the finest British clay and the single firing technique of PORCELANOSA, these have an eight year guarantee, which has been underwritten by insurance companies world-wide. This series is accompanied by a full range of corresponding stair treads and skirtings.

S.A. LA CERAMICA-GRES DE CASTILLA

Spain:
Tel: + 34 83 293384
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UK:
Mr. Trevor Jones
Tel: + 44 1773 857184
Fax: + 44 1773 853987

Mr. Declan Clarke
Tel: + 44 1396 841834
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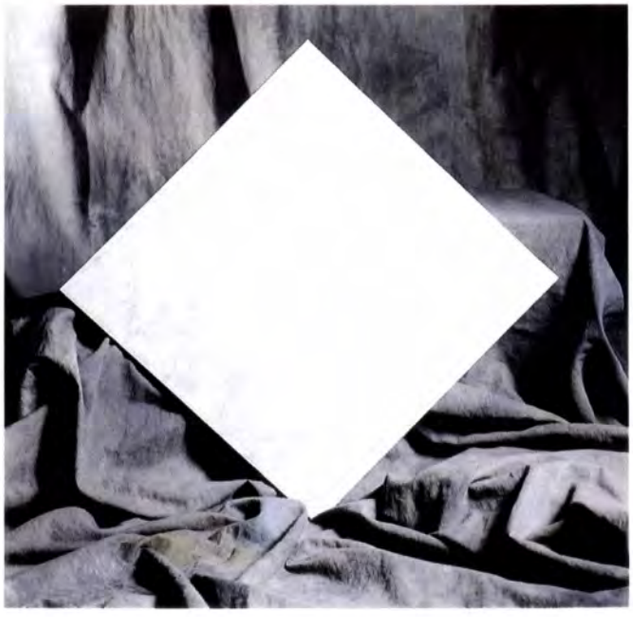
The GRES DE CASTILLA product is a high quality salt-glazed Gres renowned for its resistance to all types of extreme environmental conditions such as freezing, pollution, abrasion etc, making it an ideal product for both residential and public areas exposed to high levels of wear and tear. This type of Gres is baked at temperatures of up to 1350° for a period of 36 hours during which time salt is added creating a chemical reaction and providing the product with a salt glaze. The technical characteristics of GRES DE CASTILLA are: porosity 1-3%, frost resistance, a total chemical resistance, a scratch resistance of six in the Mohs scale, an abrasion resistance PEI II and dimensional resistance 0.13-0.14%.

STYLNUL GROUP

Spain:
Mr. Faiyaz Sheikh
Tel: + 34 64 386515
Fax: + 34 64 362259



STYLNUL produces wall tiles in 20x20, 20x30, 23.7x35 and 28x44 accompanied by decorsand listels manufactured in third fire, and floor tiles in 40.2x40.2. STYLNUL floor tiles are single-fired red body tiles which are one size and frost proof. The technical (PEI 4 and MOHS 4-6) and hygienic features of STYLNUL products make them suitable for schools, hospitals and other public buildings.

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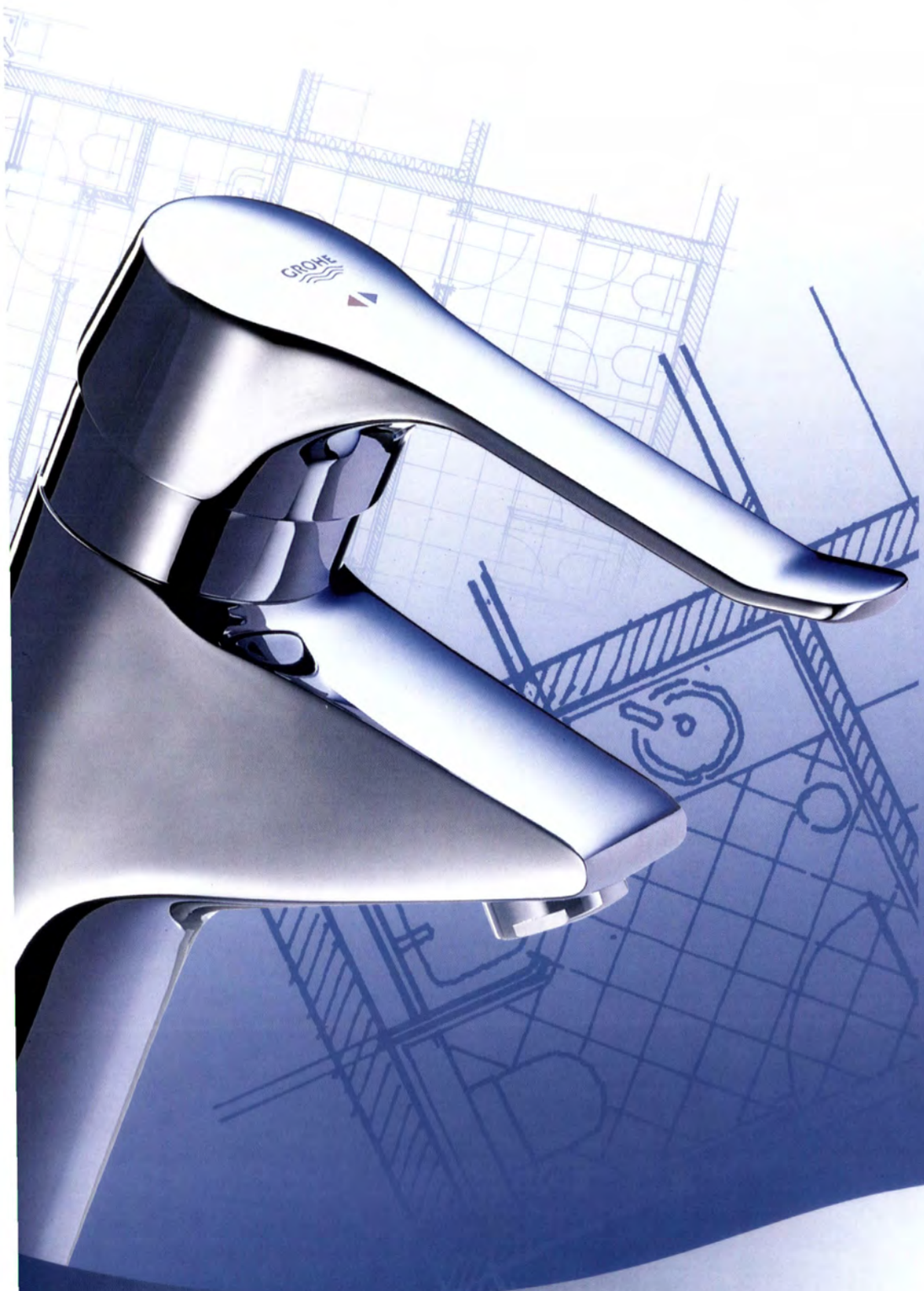

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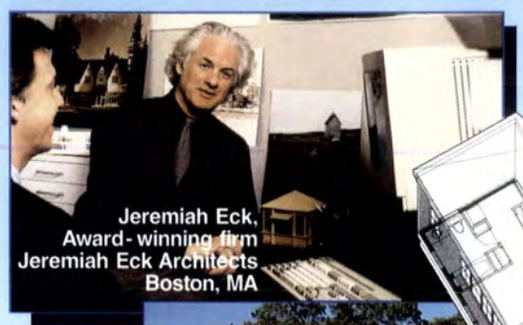

Jeremiah Eck,
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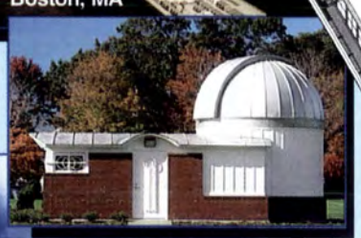
Boston, MA



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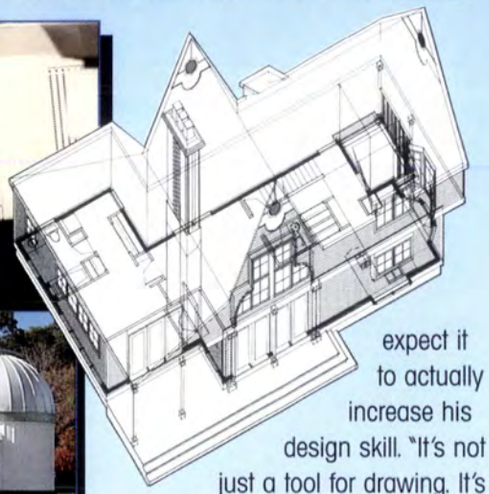

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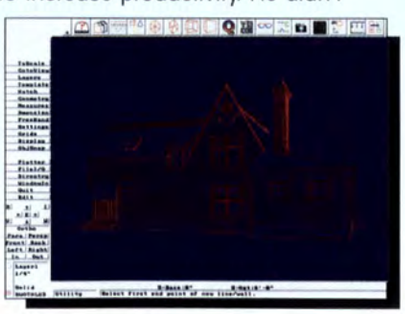

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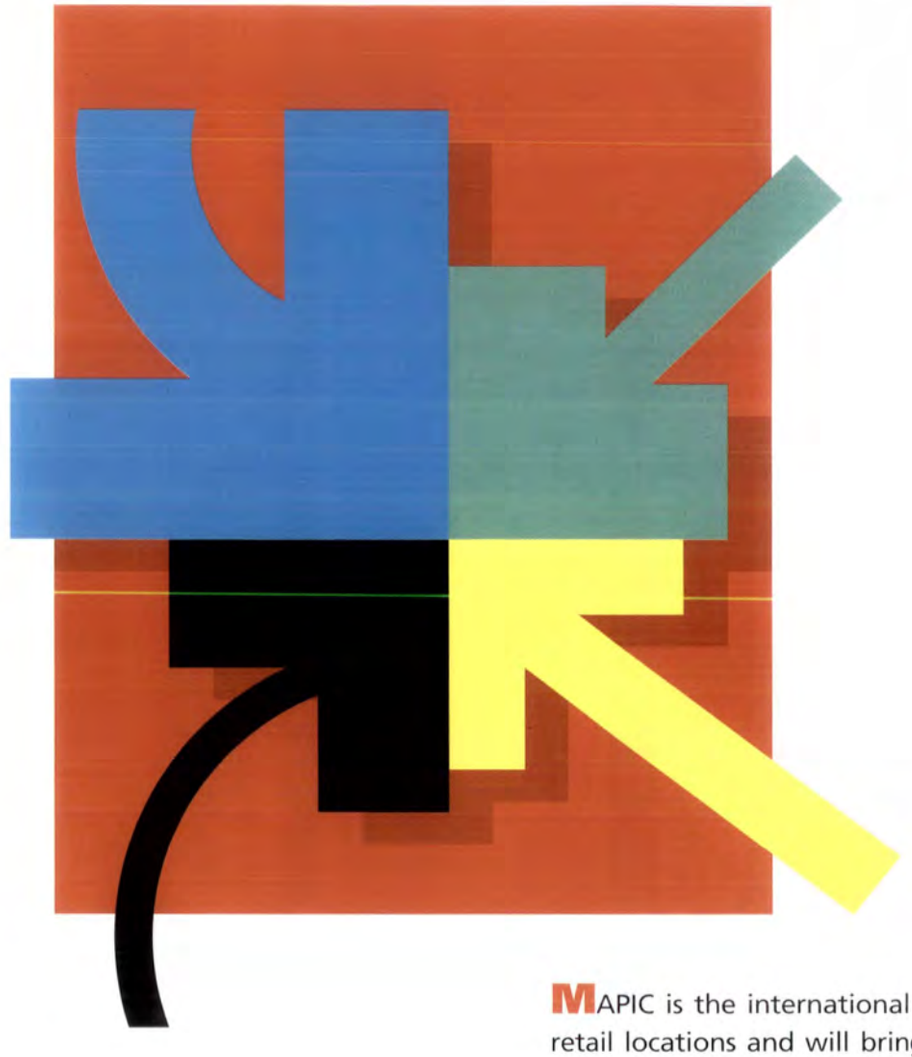

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German Architecture Centre, Berlin. Architect: Claus Anderhalten, Berlin.
Photograph of building: Hans Georg Esch, Köln. High-grade Steel Series 21: Udo Kowalski, Wuppertal.

GIRA

WORLD
ARCHITECTURE

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How tall can you go?

Over the last couple of weeks the *World Architecture* office has witnessed a barrage of press releases and testimonials regarding the definitive answer to the interminable question of which steel, concrete or mixed-material tower of Mammon can justifiably lay claim to being the "tallest building in the world". The court has been in session on this one since the race began – or at least since Eiffel's tower was eclipsed by New York's art deco Chrysler building in 1930. For the last 65 years the world's tallest buildings have been in the United States, largely in New York and Chicago – the Sears Tower in Chicago holding the record since 1973. But in 1996 Cesar Pelli's twin Petronas Towers will rise in the east, at a height of 451.9 metres above street level (1482.6 feet), and the "honour" will be bestowed on the Malaysian capital of Kuala Lumpur.

This transfer is a reflection of the wider shift of "power architecture" from the United States to south-east Asia, where bigger and taller is most certainly better – height embodying the qualities of power, success, strength and modernity on the client, architect and city in which the building has been erected. Singapore is no exception, as the work of this month's *Profile* firm, Timothy Seow, clearly shows. This city-state, little larger than the United Kingdom's rural Isle of Wight, is constructing high rise buildings at a rate that would make most Hong Kong developers blush. And the requirement is for "disposable" architecture, erected in the fastest time possible, within strict budget and spacial limitations, only to make way for the next fashionable highrise a matter of years later. With specifications such as these the success of the building is as much a tribute to the technical prowess of the engineer as the architect.

Europe is unlikely to become a contender in the race for the sky, largely for cultural and historical reasons – although the continent is eminently represented by Norman Foster's design for Obyashi's monumental Millennium Tower. On the domestic front, Europeans, and perhaps particularly Englishmen, consider their homes to be their castles. The priority is for a home with an emphasis on the individual front door. This is not the case in Singapore – and Timothy Seow has capitalised on the glamourising of "bungalows in the air". Singaporeans are content to display their wealth by inhabiting the newest and highest, serviced condominium block, and Seow has worked at perfecting the individualisation of these multi-storey housing estates. The owners occupy what is generally perceived to be upmarket accommodation, without the excessive costs of an individual house, and with the added bonus of a ready-made community above, below and all around them.

Nowhere is this difference in attitude between North America and south-east Asia, and Europe so perfectly illustrated as in the Benelux countries, which are the subject of this month's revealing *Country Report*. It might be assumed that the requirement for an overwhelming number of new public buildings in Belgium would present the perfect opportunity to produce the style of architecture symbolised by the "tall buildings" of their eastern counterparts. But it appears that bureaucracy and politics have contrived to ensure that major public buildings fall short of the bravery and brashness that comes so easily to the "New World". Government buildings, law courts and public offices retain a sense of modesty and anonymity; but the difference in the height and glamour of the buildings in Singapore, and those in Belgium, is dictated by the clients, rather than the ability or aspiration of Europe's architects and engineers.

Nicola Turner

In next month's World Architecture

Chile, German del Sol and José Cruz's Salto Chico Hotel in Patagonia

BUSINESS

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

COUNTRY REPORT - Chile

Geographically and economically, Chile is fundamental to the formation of the Pacific Rim. This long thin country on the south-west coast of South America is also one of the first Latin American countries to be seriously considered for membership of NAFTA, the North American Free Trade Agreement. *World Architecture* analyses the challenges presented to architects, planners and engineers from the vast Atacama desert in the north to the Patagonian fjords in the south.

The projects cover the largest public building in Chile, a renovated train station in the centre of the capital Santiago; a stunning hotel in Patagonia by the architects of the Chilean pavilion at Seville '92 and Humberto Eliash, Chile's most respected architectural journalist, asks Chile's youngest and most highly regarded architects about their designs for a university on the coast.

Concept: A few wooden structures built by the pupils of the Valpariso Architectural School on a sandy beach in Chile have become famous in South America. *World Architecture* visited Alberto Cruz, the head of the school, to ask what makes them so important.

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

Robert Canfield

Anshen and Allen's St Joseph's Hospital, Stockton

PROFILE - Anshen & Allen

Following on from this month's Special Report on healthcare, *World Architecture* profiles Anshen & Allen, one of the most successful healthcare firms in the US – now working in six countries across the globe.

Future Profile reports will look at Bremmer Lorenz/September; Ramirez Vazquez/October and Architekturburo WGK/December/January.

SPECIAL REPORT - Transport

Covering air, land and sea, this report focuses on an international range of transport termini which process an ever increasing volume of traffic around the world. As aircraft, trains and boats become faster and more efficient, it is vital that architects and engineers keep ahead of the game in order to build flexible "sheds" which serve both vehicles and passengers. The challenge is to anticipate developments of tomorrow through flexible solutions of today.

World Architecture focuses on projects which demonstrate a range of answers to transport design from Oslo airport in Norway to the Hong Kong metro link in Kowloon in China and the Holyhead Ferry terminal in the UK.

Further special reports will cover buildings associated with education in September; hotel and leisure/October; residential building/November, and office design/December and January.

Roderick Coyne

Alsop & Störmer's Hamburg Ferry Terminal

PRODUCTS -

In subsequent issues, Products will focus on cladding and roofing/July and August; seating/September; computers/October; bathrooms and sanitary fittings/November and the office environment/December and January.

News Review

WA's News and Business round-up

Drawing on experience

Margherita Spiluttini

While working on what is intended to become the most significant gallery of modern art in the UK at the converted Bankside Power Station in London, the famous Swiss minimalists Herzog & de Meuron were commissioned by Christoph Merian Stiftung to design a much smaller museum to display a collection of cartoons, which opened last month. Working with an existing building on a 156.5 metre plot, the architects have created a sensational understatement – typical of the style for which they have become so famous.

The modest cartoon museum has survived without state support since 1976. Herzog & de Meuron's task was to create an exhibition space and offices, within a budget of 1.82 million Swiss francs.

The sloping plot of land is a narrow strip (6 x 25 metres) which dates from the agricultural "crop rotation" traditions of the middle ages. The architects sought to explore the relationship between old and new. The museum is divided into two with a pathway joining an old house (incorporating building materials from several different centuries) to a modern addition.

A small courtyard divides the old house from the new three storey building which is much simpler and more homogenous in style. Each floor is made up of single, undivided rooms of 16 x 8 metres. The walls, as well as the glass cabinets, can be used for the exhibition (drawings, prints, photos, smaller objects).

The addition is actually made up of three concrete slabs that make up the exhibition space. This is closed off from the courtyard by a plate of glass. A glassed-in pathway joins the old and new building and divides the courtyard into two small chamber-like areas, the partly angled sheets of glass are organised so that the glass-surrounded courtyard acts as a light, bringing daylight into the inner exhibition rooms like a huge lantern. The kaleidoscopic effect is enhanced by the use of two reflecting pieces of strong glass. Movement between the old and the new building becomes an alternating play between real and illusionary space. The entrance is in the original building, as are the curator's offices, the library, and various small display cabinets. Each storey is distinguished by different details such as the wooden floors and panelling.

All change in the UAE

by John Aitchison in Dubai

Economic prosperity, driven by the discovery of oil in the United Arab Emirates in 1959, escalated by the price hikes of the seventies, has created an urban development explosion manifest in the relentless pace of on-street development within the twin cities of Abu Dhabi and Dubai.

Bolstered by the realisation of an ever-expanding, long-established free trade economy and the consolidation of a vibrant international tourist industry, each metropolis has established a world identity and has embarked on grand gestures of city image building.

Whilst Abu Dhabi as the quintessential oil capital post-dates Dubai as the nations trading entrepot, both cities present development scenarios of breathtaking scale and dynamism. The predilection of the company clients, the prime players on the urban development stage, can be identified as the creation of huge-profile "signature" buildings which exude corporate image, prestige and civic pride on a metamorphic city skyline.

Almost exclusively the client call is for a tectonic style which conjures with symbolism and alludes to the psyche-triggering images of gulf heritage; the fort, dhow, lateen sail, windtower, tent, oil-rig or falcon. More recently the trend would appear to favour a more mundane approach in emulating the European postmodernist theme but it is thought that this may prove to be ephemeral in such a bullish aesthetic market.

On the street talk is of the potential change in direction of architectural innovation with the involvement of the British architects Terry Farrell and Sir Norman Foster on projects in the Emirates – Farrell in a museum/archive for a private collector of Islamic artefacts and books (*below*), and Foster in a prestigious bank building, both in Dubai.

The nature and influence of their forthcoming works is eagerly awaited. It will be interesting to see how their internationally-popular styles translate to the Arab world. The knock on effect of the direct participation of these architectural giants in the region, it is hoped, may create a new wave of architectural "hyper" modernism which could further assert both Abu Dhabi and Dubai in the world arena as seats of architectural innovation and excellence.

Nigel Young

Polemic

In his monthly opinion column Martin Pawley warns of the threat of "styleless" new building as a result of the endless measures needed to keep terrorism at bay.

Face to Face

David Rockwell is one of America's greatest commercial success stories. In keeping with his Californian lifestyle, his answer has been an architecture based on entertainment.

Project Review

World Architecture reviews the impressive Tapcopian Plaza, including production and broadcasting studios, in the heart of the Japanese countryside on Honshu Island.

OnScreen

Reviews of the Radiance programme for calculating illumination levels; the Building Information Warehouse; "plug-ins" for web browser softwares.

Lasdun anger at National refurb

British modernist and octogenarian, Sir Denys Lasdun has accused architects Stanton Williams of turning his Grade II* listed "Brutalist- style"- National Theatre building on London's south bank into a "supermarket". Alan Stanton protests that they are merely trying to increase the space for the ground floor foyer because it is getting overcrowded and claims that Lasdun's comments are "way beyond the pale".

So is this controversial British modernist capitalising on the refurb to make mountains out of mole hills or has he got a point? "I am not an old geezer trying to protect his building at any cost" Lasdun claims. "They are going to wreck the river facade". The first £9 million of the £42 million revamp (£31 million of which is an Arts Council lottery grant) is, indeed, being spent on "front-of-house work" which extends the *porte cochere* with structural glazing. A spokesman at Lasdun admitted "We have serious reservations about the entrance and putting the ticket office and book shop under it".

Lasdun is said to be dissapointed with the Grade II* listing which, unlike Grade I listing, allows for internal adjustments that are approved and have planning permission. Lasdun's partner, John Hurley said that "this shows that the listing process does not in any way protect the building". When the list of post-war buildings was published recently in the UK, there were those who objected to the precious nature of the Grade 1 "in aspic" approach especially when it requires an injection of cash. But, with the Grade 1 listed Economist Building by Peter and Alison Smithson, the National Theatre is one of few important examples of this unique British Brutalist-style which still exist. If the National Theatre is having to be adapted 20 years later, who is to say that the refurbishment will be any more appropriate in another 20 years time? And how many "adaptations" can a single building stand before it looses its identity. Either we want it or we don't. For Grade II read "procrastination".

RTKL on the up

The design for the CPPCC Friendship Tower in Shenzhen, China (*left*) – a joint venture project of a private developer, Shirble Holdings Real Estate Development Ltd Co, and a government agency, The Shenzhen Committee of the Chinese People's Political Consultative Conference (CPPCC) – has been completed by RTKL's Los Angeles' office.

It is hoped that the 47 storey competition-winning design will "provide each [owner] with a distinctive space and identity while also presenting a singular, bold statement against the Shenzhen skyline".

The mixed-use tower includes a six level podium designed to accommodate the CPPCC Friendship House, as well as retail and enternatinment facilities and a 41 storey tower housing a hotel, apartments and offices. Construction is scheduled for autumn this year and should be completed by 1997.

"Grapes of Wrath" and Lebanese reconstruction

By Angus Gavin, in Beirut

Scenes of the burial of the 102 civilian victims from the shelling of the UN base at Cana brought home the extent of the human toll to Lebanon during the 11-27 April Israeli bombardment. Without pressures from the international community to broker an agreement "Grapes of Wrath" would have increased support for Hizbollah, itself formed as a result of the Israeli occupation of southern Lebanon. It also generated positive expressions of national unity. Israel's objectives were ostensibly to wipe out Hizbollah – 19 dead out of more than 150 Lebanese casualties – but clearly included civilian and economic targets.

The Israeli intention of damaging Lebanon's reconstruction effort seems clear: before the action senior Israeli military figures stated publicly that, unless the Lebanese reigned-in Hizbollah they would see what would become of their much vaunted reconstruction plan. Most of the damage has been inflicted in the occupied south. Some towns and villages remain relatively unharmed but others have suffered heavy damage. As well as shelling settlements, the Israelis bombed roads, reservoirs and power stations, cutting communications, telecom, electrical and water supplies.

But unlike the 1993 Israeli incursion into Lebanon, Beirut itself has not remained unscathed. Apart from the helicopter gunship raids on Hizbollah centres in the southern suburbs, two power stations on the edge of the city were precision-bombed and put out of action – the first attacks by Israel into Christian areas of Lebanon.

As yet there are no official estimates of overall damage. Detailed assessments are now being made as the basis for a reparations demand by Lebanon on Israel, which will be pursued either through the UN or the World Court of Justice, for deliberate damage to civilian installations.

On a more optimistic note, the World Bank has promised an aid programme and under the terms of the Christopher "Understanding" a Consultation Group of concerned countries will assist with assembling the additional finance now needed for reconstruction. The Lebanese leaders have also gained significantly in international stature and Lebanon is no longer seen as simply as a pawn of Syria but as a serious negotiating partner in the future peace process.

The next hurdle is the forthcoming Israeli election, around which the crisis has revolved. Optimists see the Christopher "Understanding" as a trial run for Israeli withdrawal from Lebanon. There is nothing the Lebanese would wish for more. The great majority are tired of conflict and want to rebuild their country, invest here and regain a lost but historic status as a link between east and west, a centre of culture, tourism and democracy and the one potential model in the Middle East for a multi-religious pluralistic society. The Lebanese are resourceful entrepreneurs and will take rapid advantage of commercial, investment and development opportunities once peace unfolds in the region – that happy state that still, sometimes, seems a long way off. *2 May, 1996*

Reinventing the wheel in London

While UK architects are jostling for a place in the plans for monuments to celebrate the Millennium, British architects David Marks and Julia Barfiled have pulled off a spectacular coup. No public funds are being asked for since they have secured the financial backing of British Airways who have promised £600,000 towards the proposed giant Ferris Wheel and will form a joint venture with the architects' Millennium Wheel Company to reach their target of £10 million.

The 500 foot diameter wheel will be the fourth tallest construction in London. Subject to finalising planning permission, it will be located on the South Bank of the river opposite the Houses of Parliament. Sixty 16 seater enclosed cabins will carry passengers for the 20-minute "flight" giving a view of 30 miles around, from Windsor in the west to Gravesend in the east.

The design of the wheel is concieved as a vast moving silver/white sculpture rather than a fairground wheel. Engineers Ove Arup propose to harness the tidal power of the river via turbines. Solar cells in the cabins will power ventilation, heating, lighting and communication systems and passengers will be able to use headsets to select commentaries in the language of their choice.

This is an admirable attempt to equate the Millennium with a practical realisation of environmentally friendly technology. But, although it is near to the site of the Skylon (the famous eliptical shape of the 1951 Festival of Britain) the Ferris Wheel is sensational rather than sophisticated. It subscribes to the "taller than thou" philosophy and fits nicely into the late-twentieth-century idea of "spoon fed"-entertainment. Commercial backing for the Millennium is, potentially, a symbiotic situation and British Airways have already got considerable publicity out of supplying only six percent of the necessary capital for the Wheel – but, for the sake of London's skyline (and for everyone within a 30 mile radius) it is worth remembering that high profile can be metaphorical as well as literal.

In Brief

Petrol station design fuels Minale Tattersfield & Acton

Marcello Minale, of Minale Tattersfield & Acton is loudly confident that his firm will soon lead the world in petrol station design. The latest of their recent three major designs is an assignment to update 1080 petrol stations in Italy for Italiana Petroli. Another of the group's projects is for Thai Oil. The firms designs for the first "mobile" petrol stations are now under construction for Agip in Russia. The prefab-24 hour-assembly stations are aimed at a worldwide market. They are particularly suited for temporary petrol stations at motor racing venues, as Agip, a sponsor of the Ferrari Grand Prix team, will soon be demonstrating.

Malaysian scoop

The masterplanners for a 200 hectare site in Malaysia, encompassing Kuala Lumpur city centre and airport, and the Putrajaya Federal Administration Centre, are London's Fitzroy Robinson.

University of Cincinnati promotes African American Architects

A Directory of African American Architects containing 1,158 names and contact information for the USA's professionally licensed African American Architects has been complied by Dennis Alan Mann, UC professor of architecture and Bradford Grant, professor of architecture at California State Polytechnic. The directory, which is intended to enhance the professional prospects of such architects, is an updating of an initial record published in 1991. The directory costs US$17.50. For further information telephone: +1 513 556 3413

US architects sue Acog for Olympic cash

Ellerbe Becket is just one of four US architects, including Heery International, Rosser International and Williams Russell & Johnson, who have filed a US$4 million claim against the Atlanta Committee for Olympic Games (Acog) – organisers of this year's Olympics – for extra work amounting to more than 46,000 man-hours. They are joined by the engineering services who are putting in a claim for an additional US$1.4 million.

Shop 'til you drop

The APP Partnership, based in the UK, is celebrating their appointment as masterplanner, concept architect and project manager for two Italian non-food retail parks, one in Bologna, the other in Savinano (between Ravenna and Rimini). The two projects total in excess of 100,000 square metres.

Department store transformed

New York architects Gwathmey Siegel & Associates have transformed a downtown department store in the city into the Science, Industry and Business Library (SIBL) to incorporate the most advanced computer technology in keeping with its image as a library for the "Information Age". The elegant 1906 renaissance revival facade contrasts with the modernist interior reflecting the image of the building as a "library without walls". There are no unnecessary barriers between staff, public and business and research users. The library has already been acclaimed as a classic solution to preservation and adaptive re-use.

Spanish right axe Calatrava project

by David Cohn, Madrid correspondent

One of the more improbable projects of the Socialist era in Spain was to have been Santiago Calatrava's City of Science, in his native Valencia, a 240 hectare (600 acre) complex with a hemispherical cinema/planetarium, a 100-metre nave for a science museum, and a three-legged retro-futuristic telecommunications needle, which, at 80 storeys plus, aspired to be the highest structure in Europe. The horizontal spread and vertical thrust of the project's model seemed a throwback to the boundless optimism of postwar American visions such as SOM's Colorado Air Force Academy or Frank Lloyd Wright's Mile High Tower.

Commissioned by the autonomous regional government of Valencia under Socialist President Joan Lerma in 1989, the project began construction in 1995, with an estimated budget of US$247.5 million. But local elections in May 1995 brought an end to 12 years of Socialist rule in Valencia, and the new government of the conservative Popular Party cancelled the project in December. José Luis Olivas, Counsellor of Economy and Taxation, faulted the high cost and impracticality of the proposal, explaining that full costs had not been correctly estimated, that the museum would be too large and expensive to maintain, and that the planned 8,000 square metres of office space in the legs of the telecommunications tower made no commercial sense in the currently stagnant market.

The Populists have replaced Calatrava's work with a proposal closer to their own concept of the public benefit, a park loosely modelled on the Expo 92 of Seville with theme pavilions housing the various elements of the science museum, an aquarium, boats and waterside restaurants and cafés, a shopping centre, hotels, and various potential commercial sites. Their rough budget is US$187.5 million, not much less than Calatrava's project, but part of the investment would be recovered through the many commercial concessions.

But the Populist's move, coming after foundations for Calatrava's buildings have already been completed, seems to have created as many problems as it solves. Olivas rather off-handedly foresees the Science Museum foundations becoming an underground garage for the park. And he plans to contest in court the handsome penalties written into the architect's and builders' contracts for cancellation, 20 percent of the budget, US$15 million for Calatrava alone.

As two models of political action, Calatrava's project and the Populist alternative reflect the difficulty of finding a balanced approach to public works in Spain. The Socialist years represent for many unbridled public spending, with works often poorly planned and managed, and conceived more for their symbolic value than practical necessity, overcompensating for the paucity of public investment in the Franco years. But others charge that the Populists threaten the public sphere by translating government action into the commercial terms of private initiative and profit.

People and Practice

OMA - De Weger merger

by Kelly Shannon

The Office for Metropolitan Architecture (OMA)/Rem Koolhaas and another Rotterdam-based firm, De Weger Architects and Engineers, are taking stock after merging at the end of 1995. Both offices maintain autonomy, however Koolhaas and Wim Steutel co-direct the merged firm. The stated "purpose of the collaboration is to abolish the separation between technique and architecture and to reach with this new approach the entire field from individual buildings to infrastructural and urbanistic projects". De Weger now has 50 percent financial stock participation in OMA. Architectural, technical and structural collaboration between the offices will no doubt take place in the newest commissions for OMA, including a 55 million square foot development of Universal City in Los Angeles (doubling the current size of the motion picture, television and entertainment business), and the H-project for Samsung in Seoul, Korea where OMA is responsible for the master plan as well as the buildings for social studies and sports education.

BDP appoints new global chairman

One of the largest international UK-based architect/ engineer/ surveyor practices, Building Design Partnership, has appointed Richard Saxon to succeed Kenneth Draper as Chairman. Saxon will continue in his current role as Chairman of BDP's London office, as well as that of overall Chairman. He has worked as a government adviser and is the current president of the British Council for Offices. Saxon is a successful architect – his projects include the masterplanning of the All England Lawn Tennis Club at Wimbledon and the headquarters for Adam Opel near Frankfurt, currently under construction – but he is also well known for his books on atrium design. They are now the standard texts worldwide, published in the UK, USA, Russia, Japan and the Republic of China. Saxon has pledged to devote time to the further development of BDP International, the alliance formed between the UK firm and its partners in Germany, France and Spain.

Entec Europe expands in the Emirates

For the last 20 years Entec Europe Ltd, the leading international environmental consultancy, has been advising major industrial corporations, governments and international funding agencies throughout the Middle East on water resource management, waste minimisation, risk and compliance management, amongst many other services. The Middle East arm of the company is Shankland Cox Ltd, whose existing offices include one in Abu Dhabi, Al Ain (UAE) and Muscat in the Sultanate of Oman. The new office will be in Dubai.

Pritzkers win prize

On 14 May Philip Johnson, Frank O Gehry, Richard Meier and Robert Venturi gathered at the National Building Museum in Washington DC to see Cindy and Jay Pritzker – founders of the renowned Pritzker Architecture Prize – receive a well-earned, if predictable, prize themselves. They are the recipients of the National Building Museum's 1996 Honor Award. The Pritzkers annual prize honours a living architect "whose built work demonstrates a combination of those qualities of talent, vision, and commitment that have produced consistent and significant contributions to humanity and the built environment through the art of architecture".

Three major projects by ELS/Elbasani & Logan awarded by AIA

The Anaheim Downtown Plan – to revitalise the centre of the town, more than half of which has been completed or is under construction – the Irvington Community Center in Fremont, California, and the Courtyard House, in Berkely, have earned ELS/Elbasani & Logan three merit awards at the American Institute of Architects East Bay Chapter's 1996 Design Awards ceremony.

Dubai's high-speed stadium

The Genoa based Emilo Morasso firm has produced a tennis stadium for the Emirate of Dubai in just six months. Early last year, the Government of Dubai gave the green light for the construction of a permanent home for the Dubai Tennis Open. Located on the grounds of the Aviation Club Tennis Centre, the new stadium and five existing side courts, will be a main area of activity during the tournament week. The incredible six month deadline for the 1996 Tournament was reached by building firm Khansaheb with assistance from Al Bowady Company and Mario Donato.

"I wanted lightness, fluidity to the whole structure" said Morasso. "Too many stadiums around the world are heavy, box-like, as if borne down by an unbearable weight. I wanted to move away from that". Morasso feels that "The white dishdashas, are so soothing to the eye, so perfect for a desert terrain. For a country of blue skies, white is a wonderful colour". Combining this with his respect for the traditional Arab architectural forms, such as the "souk" Morasso has designed the white tent like structure over the Royal enclosure. But the stadium is also functional with seating for 5,000 and luxurious facilities for players. Eleven of the world's top 20 players are making their way to Dubai to play in the 1996 new stadium and to stand a chance of winning the US $1million prize money.

Big Dig transforms Boston

by Graham Vickers in Boston

It is likened by people here to the Pyramids, the Hoover Dam and the Panama Canal and has been called "a wonder of the world" by the United States Transportation Secretary. The Big Dig, as everyone here calls the eight miles of tunnels and high-ways being built through the heart of Boston, is the largest public works project in America and the most expensive stretch of highway. But what is perhaps most remarkable about the US$10 billion project is the 20 years of political engineering and social planning that went into it.

Boston has had a long and bitter experience with the old method of highway construction that ravaged cities, and bulldozed houses, businesses and neighbourhoods. The Big Dig was designed to repair past damage and reconnect communities that had been cut off from one another by asphalt, concrete and cars. The Channel Tunnel between France and England was as ambitious, said the Massachusetts Transportation Secretary, James Kerasiotes, who is overseeing the Big Dig. But that was built under water. "They weren't building in anyone's neighbourhood", Mr Kerasiotes said.

In Boston, they are building in a lot of people's neighbourhoods: from East Boston to Charlestown, from Chinatown to South Boston, from the South End to the North End. Not a single house has been taken, not a single family displaced. Five years after ground was broken, the heaviest building is going on in congested downtown. Boston for the most part is going on around the Big Dig. Under the plan, in which work is to be completed in 2004, Boston would be transformed. An eight-lane underground highway, much of it covered by parkland, will replace the obsolete, traffic-clogged elevated highway – the Central Artery – that cut an ugly swath through downtown when it was built in the 1950s. Boston will regain access to its waterfront, and the North End will no longer be separated from the rest of the city by the artery. The project also includes public-transit improvements. The Big Dig will require the excavation of 12 million cubic yards of soil, enough to fill Fenway Park 14 times, enough concrete to build a sidewalk from Boston to San Francisco and back three times, and enough steel for a one-inch bar that would reach around the Equator.

Guggenheim to reopen this summer

by Susanna Sirefman, in New York

The Guggenheim Museum Soho in New York City recently announced a collaboration with the German telecommunications carrier Deutsche Telekom. The downtown venue of the Guggenheim is due to reopen on 14 June 1996 after expansion and renovation that has been financially supported primarily by Deutsche Telekom. The four galleries of the main floor of the Guggenheim will be named the Deutsche Telekom Galleries. The museum is in the first phase of its development as a state-of-the-art multimedia museum. Interactive virtual reality facilities, CD-ROM stations and a 14 x 51 foot long video wall (called an "electronic canvas") are in the design stage. This joint venture with Deutsche Telekom enables the Guggenheim access to the technical expertise, electronic technologies and resources such multi-media artwork requires. Arata Isozaki, the architect for the Museum when it opened in 1992 is also responsible for the new design. The continuation of the project has allowed Isozaki to complete his original intended scheme. Ten thousand square feet below the existing ground floor will be converted to public programming space and the entrance will be relocated. The visitor need no longer traverse the Museum shop before seeing the exhibit. The opening show titled "Mediascape" will present a diverse selection of media-oriented works. Nam June Paik, Bill Viola, Marie-Jo LaFontaine, and Bruce Nauman are some of the participating artists. Zentrum fur Kunst und Mediatechnologie(ZKM) in Karlsruhe, Germany have lent many works from their collection to this exhibit.

Tears of Steel – *Marie-Jo LaFontaine 1988. Video and sound installation*

In China, Anshen + Allen break with tradition...

Anshen + Allen, the US firm to be profiled in next month's *World Architecture*, have proven that there is more to them than their predominant healthcare image by winning an international design competition for the Shanghai WayToFund International Finance Center. The project is estimated to cost US$133 million. This is the second Anshen + Allen building in Shanghai – the first is the Shanghai Far East International Center, currently under construction. The building is on a prime site in Shanghai, located at the intersection of the Suzhou and Huang Pu rivers. It will be seen as a link between the historic Bund district and the rapidly developing Pudong district along the Huang Pu, thereby incorporating Shanghai's rich past with its promising future.

...and John Portman & Associates wins three major projects

Also in Shanghai, Atlanta-based firm John Portman & Associates, who have been working in China and the Far East since the mid eighties, are to design a high-rise mixed-use complex for the Shanghai Sunjoy Real Estate General Company. The rather bizarre diamond-shaped futuristic tower is said by the architects to symbolise "Shanghai as a city looking ever forward". The firm have also been commissioned to design the Shandong Province Bao Feng Building, a mixed-use tower in Jinan, and the Westlake International Hotel a 400-room hotel/mixed-use complex in Hangzhou on the shores of the scenic West Lake.

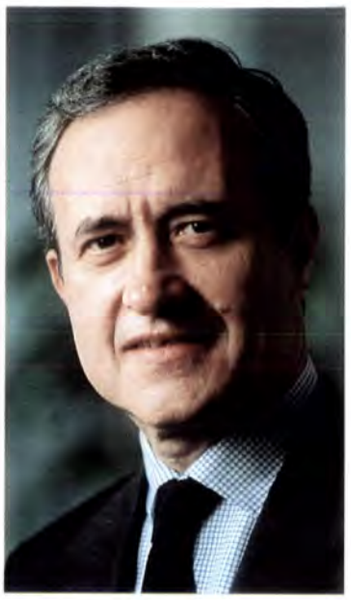
Paris – village life

by Michael Rowe, France correspondent

Paris city mayor Jean Tiberi (*right*) wants to reinforce the feeling of neighbourhood in a capital that first came together as a collection of villages. If adopted by the municipal council a new urban scheme outlined by Tiberi in April will switch the emphasis decisively from the prestige projects of the Mitterand era to small-scale plans aimed at encouraging local businesses, restoring distinctive district architecture, and improving the provision of public spaces.

Should the mayor get his way, the city's architectural department will be supplemented by a special team of architects who will concentrate on heritage and conservation issues. Also, following half a century of rapid change the city will be given a breathing space before any major new projects are initiated, and its citizens will be more extensively consulted before any important planning decisions are taken.

In addition, Tiberi is determined to put the brakes on new office developments in the city's main business districts and to encourage the conversion of empty office blocks into flats. Some four million square metres of offices currently lie vacant in the Paris region as a whole. The Paris council itself is carrying out some 110,000 square metres worth of such conversions, though the private corporate sector has not yet been persuaded to do likewise.

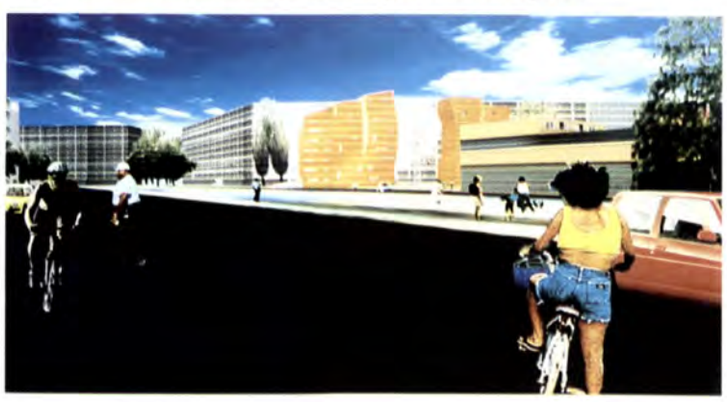


At the same time the mayor is trying to reconcile these moves with a wish to boost the role of Paris as a major European business centre. Significantly, Tiberi is keen on going ahead with existing plans to build a new business and residential district in the Seine Rive Gauche redevelopment zone on the eastern side of the city. He is also planning a summit meeting of European mayors with similar preoccupations for next year.

Which begs the question of how the major European city of London will be represented as it is still the only European country without a Mayor, or any individual leader, of its capital city.

Concept – stop press!

Unfortunately this month's *Concept* feature on the work of Erik van Egeraat went to press before we were able to replace the illustration of his preliminary ideas for the Bijlmermeer urban study with a more realistic CAD image of the definitive design of this housing scheme (*below*). The date of the project is 1995, not 1994, as printed. Our apologies to Mr van Egeraat.



After post-modernism, terrorism

"Terrorism... bids fair to put an end to architecture as we know it, once and for all."

Thirty years ago the late Charles Moore, father of post-modernism in America, published an essay about the future. "If architects are to continue to do useful work on this planet," he wrote, "then their proper concern must be the creation of place... To make a place is to make a domain that helps people know where they are and, by extension, who they are."

In broad terms it – Moore's plea that architecture should deliberately aim for uniqueness by taking its cues from history and context, rather than picking up on such novelties as airports, factories, skyscrapers and autoroutes – stopped modernism dead in its tracks. Within twenty years post-modern architecture had given birth to a whole new category of "stealth" buildings that combined a regional "heritage" appearance with space age interiors the international style would never have dreamed of.

The combination of old and new and the separation of interior and exterior were the crowning achievements of post-modernism. It must have been a bitter blow to Moore himself, who died in 1993, to see how directly they led to another kind of international style, the unmistakable style of the giant mixed-use commercial developments that are now under construction everywhere from Berlin to Bangkok. These schemes, with their architecture of new versus old, interior versus exterior and plan versus elevation, are united only in their dedication to a serviced floorspace as universal and general as the international style ever was, but they look like places. They are what has enabled the followers of Charles Moore to say that they really have "helped people know where they are and, by extension, who they are."

It is in this sense that post-modernism has carried out Moore's mission to the letter. A little disappointing to see a Chinese temple on top of an American skyscraper perhaps, but you can't dispute that it tells you where you are and who you are. Unfortunately what it can't tell you is that the triumph of post-modernism was by no means the Armageddon of style wars that it was cracked up to be. No sooner did the struggle between internationalism and uniqueness settle down to an uneasy compromise, than another villain lumbered onto the stage. A villain more deadly to architecture than any killjoy arrogance of modernism or decorative historicism of post-modernism had ever been. The new is another "ism", of course, but it is not a style. Instead it is the enemy of all styles. Its name is "terrorism", and it bids fair to put an end to architecture as we know it, once and for all.

The architecture of terror begins with the universally acknowledged need to protect the highly serviced and vulnerable technologies of the modern world. Faced with a terrorist threat, governments, banks and developers seek to safeguard these structures by seeking the advice of military experts. As time passes and the terrorist threat, far from evaporating, becomes a continuous, low-intensity war, the influence of these security experts spreads from advising on retrofit technology – designed to make existing buildings and installations more resistant to attack – back up the line to planning decisions about where facilities should go so as to make attack difficult and escape after it impossible. In Northern Ireland this kind of planning began a quarter of a century ago and continues to this day.

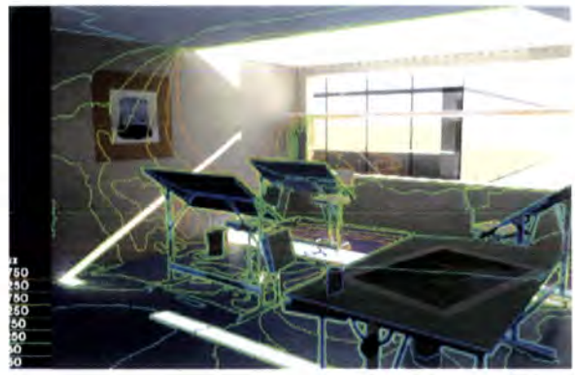
After planning decisions come directives to architects. When the level of terrorist attack rises sharply, or the damage it causes begins to run into billions of currency units, calls to "design it out" become impossible to resist. This happened after the 1993 and 1994 bombs in the City of London. It also happened after the 1993 World Trade Centre and 1995 Oklahoma bombs in the United States. It happens after ETA attacks in Spain, after Tamil attacks in Sri Lanka, Palestinian attacks in Israel and the Lebanon, cult attacks on urban systems in Japan. It happens everywhere. And one of its most obvious but least talked about effects is upon the appearance of buildings.

In their day, the International Style and post-modernism both dealt with changes in historic architectural elements: shape, shadow and line, fenestration, proportion, prospect and function. Where the security adviser becomes the lead consultant, these elements do not change so much as disappear. Since the first rule of security is to make the target inconspicuous, any architectural *tour de force* is out of the question. Urban sites in general are discouraged. Landscaping, including trees and shrubbery, must be kept away from buildings. Glass cladding for external walls is banned and transparency everywhere is suppressed by floor to ceiling splinter screens. Windows in external walls are discouraged. Decorative features that might obstruct surveillance cameras are deleted. Recesses, reveals and returns, undercrofts and external access stairs are not allowed (they provide hiding places for bombs). Public access to atriums is denied, all entry and exit points are minimised in number and monitored at all times, cars are not allowed near buildings, and car parks are sited far away.

The results of these and a hundred other measures will be to create a styleless architecture, its buildings nondescript fortresses of serviced floorspace that will only breath freely inside their own armoured carapace. In contemplating such structures our thoughts return to Charles Moore. Like prisons, such places will certainly help people know where they are and, by extension, who they are.

Martin Pawley

OnScreen



LOOKING RADIANT!

What do Ove Arup, Siemens and the International Energy Authority have in common? One thing is that they all use Radiance. This is a programme for calculating interior and exterior illumination levels, (*above*), and for rendering them fully and accurately. It was principally designed by Gregory Ward of the Lawrence Berkeley Laboratory in California. The programme uses a form of reverse ray tracing, first setting out the space to be illuminated with the reflectancy factors for the relevant surfaces, then tracing light distribution back to light sources, and then through repeated iterations to achieve a complete analysis of the lighting levels throughout the space.

There are a number of programmes that can do this, but Radiance can also be used to create a fully rendered and colour accurate image of the lit space. Thus the programme not only gives physically accurate measurements, enabling the architect to check that lighting levels meet the relevant regulations, but also provides a visual image of the lit effect, to be judged on aesthetic or practical grounds. The programme requires considerable memory (and a fast processor or considerable patience for developing renderings) so it is best used on a Unix platform, though it will work on a 386 DOS system. For more information see their website: *http://radsite.lbl.gov/radiance.*

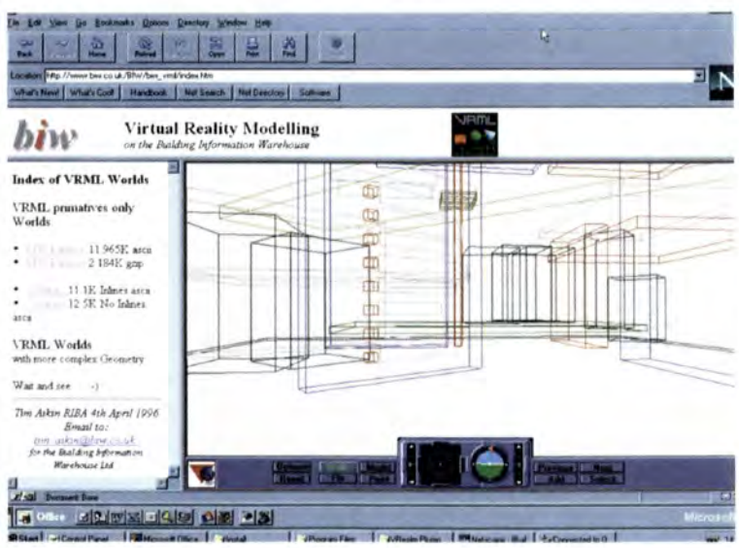
SITE OF THE MONTH – BIW

In the information age, knowledge empowers. So the Building Information Warehouse (*below*) was set up to help provide a place where construction professionals, educationalists, contractors, product manufacturers, publishers, journalists, institutes, trade associations, researchers and software vendors can all communicate with each other and display their wares. It acts as a "Who's Who" on the Internet in the UK world of construction, with a growing series of links to other international sites, such as AEC Info in Canada. Registration on the site is free, with a mini-web page giving E-mail and individual site links. The upgraded features include a newsstand and search engine. Netscape Navigator 2.0 is recommended for accessing the site. A beta-version using VRML (Virtual Reality Markup Language) so that the site can be explored in three dimensions, is under test and will be launched soon (the two dimensional version will continue for those who do not have three dimensional browsers). The site is an excellent example of a well structured information source, and will hopefully develop into a valuable forum as more architects get on-line, and the network of international contacts builds up. The BIW site was upgraded in April 1996, and is now managed by Tim Aikin. It is at *http://www.biw.co.uk*

PLUG IN, TURN ON... DROP OUT?

Plug-ins allow web browser softwares (such as Netscape or Microsurf) to read files in special formats not recognised by the main browser software, so that you can see documents – such as CAD format files – on screen over the web and Internet. With the increasing use of the net and the web in architecture, three main players – Autodesk, Bentley Systems and CadKey – have recently announced plug-ins to get their different files Internet-enabled.

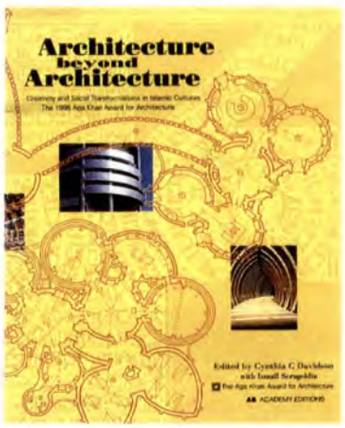
This would be good news if the plug-ins were more compatible. The Bentley version turns MicroStation into a web browser, rather than making a web browser MicroStation-aware, and the Autodesk version requires the sender to convert files into a new format before they can be read. This risks causing in-house confusion as to which is the latest version of the file, quite apart from the additional workload of preparing files. Neither Bentley or Autodesk seem to have got the message that the net is about open information. If CAD products are going to keep up with the pace of change, making them net-friendly is essential, not optional. The CadKey plug-in is called SiteSculptor – it has VRML capacity, and can import DXF files transfers. This is a good step ahead but it has its drawbacks, particularly that accuracy is sacrificed to rendering appearance, which reduces the value of the image for practical use. For more information see the Upfront eZine on *http://haven. uniserve.com/-ralphg/*



CHECKING THE SCREEN

"If a colleague shows me a design on screen which I want to modify, I simply pick up a marker and redraw on the screen." The Czech architect and designer Borek Sipek is proud of the fact that he cannot even turn a computer on: "I always design on paper" he says. But his architectural practice in Amsterdam is fully computerised, using MiniCad at present but planning to move also into AutoCAD later this year. According to Stepan Rektorik, Sipek's chief assistant, CAD systems allow for the rapid development of a project once the main design is established. "It takes the routine tasks out, and so allows the architects to concentrate on the creative aspects." But what happens when Sipek starts drawing on the screen? "If I want to make problems, I can just change the scale on screen!" Rektorik laughs "but generally we have developed a way of working." WA

Books



AWARDING ALTERNATIVES

Architecture beyond Architecture: Creativity and Social Transformation in Islamic Cultures. The 1995 Aga Khan Award for Architecture.
Edited by Cynthia C. Davidson with Ismail Serageldin. The Aga Khan Award for Architecture/Academy Editions 1995. 176pp. £24.95 (hardback)

Reviewed by Jo Newson

Architecture beyond Architecture illustrates and comments on the 1995 Aga Khan Award for Architecture. Since its inception in 1980, the award has recognised examples of excellence in Muslim societies, and a total of 1,600 projects have now been evaluated.

The award has always taken a pluralistic approach to excellence, taking into account three categories of criteria: conversation, designs that are "indicative of a new architectural expression", and those that address social concerns. As a result the award has been pioneering in recognising buildings that do not conform to the glamour and shine normally associated with architectural excellence, and in helping to reassess useful concepts not only of quality but of architecture itself. Winning designs have included mud mosques, schemes for self-build mass housing, landscaping schemes and housing upgrading projects. Hi-tech buildings (notably the Institut du Monde Arabe in Paris in 1989) have been the exception rather than the rule.

In 1992 the Master Jury made "social responsibility" its central theme. The 1995 award took this concept further, declaring its focus as "a social discourse that makes no distinction between contemporary problems and the heritage", and thereby asserting a holistic approach. Within this framework, it has separated the criteria into projects that contribute to the "critical architectural and urbanistic discourse" and those that "introduce innovative concepts". These new categories still incorporate two conservation projects: the restoration of Bukhara Old City in Uzbekistan and conservation of Sana'a, Yemen, and include at the furthest extreme of "architecture" a reforestation programme by the middle East Technical University in Ankara.

While the book includes illustrated descriptions of all 12 premiated designs, space is given to essays, and to excerpts from discussion between jurors, which bring to the fore the continuing debate about the dichotomy of fundamentalism and westernisation, or tradition and modernisation, and the search for a path between them – an alternative tradition – which the award has conceptualised as "space for freedom". An interesting illustration of the dichotomy is illustrated by Rasem Badran's Great Mosque and redevelopment of the old city in Riyadh which, while returning to pre-industrial models of integration of the building into the urban fabric, follows characteristically modernist forms of typological expression in the new mosque.

A new departure is suggested by the award's choice, for the first time, of a high-rise building: Menara Mesiniaga in Kuala Lumpur, designed by Ken Yeang. This office tower, with its spiralling "sky gardens" and its glass and steel curtain walls, is the culmination of Ken Yeang's decade-long research into bioclimatic design for tall buildings, which, while recalling the climatic architecture of Frank Lloyd Wright, also provides inspiration for an new architectural vocabulary. As Peter Eisenman points out, this building does not recast western ideas or Islamic motifs, but shows an alternative strategy that arises from the cultural concerns of Malaysia today. A consensus of the jury was that the award should see its mandate as appealing to young architects to take the risk of being neither traditionalists nor western; this would be a way for Islamic culture to promote what Eisenman refers to as "the possibility of a high art, avant-gardist culture".

The award also aims to develop "a tougher, more critical stance, and a more interactive contribution to the critical discourse", in part by the publication of the deliberations of the jury. Arguably the real challenge, however, is to bring the concerns of the "third world" to the fore in the "first world". As societies themselves become more pluralistic and globalisation continues apace it seems that the award now has more chance of entering the mainstream of architectural debate.

0% CREDIT

S,M,L,XL *Rem Koolhaas and Bruce Mau. Uitgeverij 010, Rotterdam. 1,376pp. £64.50 (hardback)*

Reviewed by Martin Pawley

There hasn't been a book as heavy as Rem Koolhaas's magnum opus since libraries stopped lending the complete works of Jeffrey Archer, yet despite its old fashioned bigness it is a book that no architectural reviewer has been able to understand. Instead of straightforwardly describing it as the final solution to the narrative problem (which in literary terms is what it is) all of them have searched instead for the key to post-post modernism somewhere in its pages – the very thing that does not exist. Despite what it says on the jacket, *S,M,L,XL* is not a novel about architecture. Despite New York Vogue, it is not, "In the great tradition of Tolstoy or Dostoevsky" (clever though that "or" is). Nor is it, as another reviewer gushed, "simply about bigness". It is simply a practice brochure for a different kind of practice.

Apart from that, the most interesting things about *S,M,L,XL* can be simply stated. In descending order of significance they are: (1) The title, which is so brilliant that it sells the plot to people who haven't seen it and can't afford to buy it, as well as potential readers. Given the space one could write a dissertation on the significance of this title as a book in microform. Suffice to say it is as successful and meretricious a title as *Small is Beautiful* and that's saying something. (2) Size and shape *S,M,L,XL* looks like a book, but not like your average run of the mill architecture book (big pictures, small print, no brain). Instead it looks like a cross between a parts catalogue on a trade counter and a family bible. This too is a triumph. Most coffee table books are decorative accessories: this one is a decorative imperative. It cries out to be the only book in the house. (3) Contents. Here we run into shoals. One picayune reader, still picking his way through the end papers, found incontrovertible evidence that the Office for Metropolitan Architecture was founded in 1975 but already had 10 staff in 1972. Another objected to Koolhaas' endless running list of *bons mots* because it included great chunks of unacknowledged Kurt Vonnegut and Tom Wolfe. A third admired the terse comment on China's future: "Two billion people won't be wrong".

A fourth chuckled at the account of Japanese meetings; "Nobody leaves the room before 300 decisions are made".

A fifth thought the legs of the Saint Cloud house looked like a stork. A sixth searched in vain for plaudits for Matthias Ungers or Alvin Boyardsky. A seventh thought recent articles in *Architecture New York* about Edith Farnsworth and Mary Tyler Moore had been triggered by Koolhaas's fantasy about the Barcelona Pavilion. An eighth (and the last) thought of Buckminster fuller and weighed the book. It weighs 2.27 kg. Guaranteed six times as much as any other book. **WA**

Events

TRADE SHOWS

AUSTRALIA
Interbuild – International Building and Construction Exhibition 23-26 June and 21-24 July. Australian Exhibition Services Ltd, Illark Plaza, 424 St Kilda Road, Melbourne, Vic 3004. Tel: +61 3 867 4500. Fax: +61 3 867 7981

CHINA
'96 China International Construction Survey, Design and Interior Decoration Exhibition 27 -30 August 1996. Exhibition Centre, Beijing, China. Tel: +8 6 10 505 1585. Fax: +8 6 10 505 1582

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

GERMANY
CONSTRUCTEC '96 Leading international construction market show will include a special 'Europe Symposium' 7 November 1996 Hannover Fairs Information Centre, 25 Hurst Way, South Croydon. CR2 7AP. Tel: +44 (0)181 688 9541. Fax: +44 (0)181 681 0069

USA
Green Building Materials '96 24-25 June, 1996. Trade show with a conference for specifiers, builders and manufacturers. The program will explore important issues these professionals have concerning the specification and manufacture of so-called "green" building materials. Radisson Hotel, Gainesville, Florida. Contact Dr Charles Kibert Tel +904 392 7502. Fax +904 392 9606

Roofing warranties, maintenance and lifecycles trade show and symposium. 28-30 June, 1996. Held during the Construction Specification Institute's fortieth annual convention and exhibition in Denver. Contact Lisa Derby. Tel +800 689 2900 ext 772

LECTURES, CONGRESSES AND CONFERENCES

ISRAEL
International conference on innovative urban and architectural policies. 9-16 July, 1996. Seminar: "Technology, place & architecture". Contact Lynne R Rosman. PO Box 7912, 91078 Jerusalem. Fax: +9272 2 610028

THE NETHERLANDS
European Designer '96 Conference. MECC bv PO box NL 6201 BP Maastricht. Fax: +43 383 8300

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

UK
London in the 21st Century A series of public debates on new visions for the capital: 12 June, 2001: the Cultural Life of the Capital; 3 July, Communities or Ghost-towns? Housing in London; 12 July, The State of the Capital: Changing London for the Good. All debates: 6.30pm at Westminster Central Hall, London. Tickets available on the door or tel: +44 (0)171 332 3770

World Canals Conference International Convention Centre, Broad Street, Birmingham, B1 2EA. Booking information about the conference or exhibition space available on: Tel: +44 (0)121 212 4433. Fax: + 44 (0)121 212 4488

LECTURE – REVIEW

IMRE MAKOVECZ – 7 May 1996, RIBA, London, UK

History was made when finally the Hungarian architect, Imre Makovecz was given permission to lecture at the Royal Institute of British Architects. "Ten years ago it would not have been possible for me to speak in this way", he said, although he claims that his work is actually not concerned with being "pro or anti the regime" so much as his rediscovery of a national style as a foundation for the future. "Architecture" according Makovecz, "is a language in itself" and his anthropomorphic wooden forms were indeed viewed as a political statement. Disillusioned with "souless" state architecture, he designed roadside cafes in the traditional national style in the early seventies and developed a passion for wood while working as a logger after he was expelled from the state architecture office before, ironically, being selected to represent the same state with his Pavilion for the Seville Expo in 1992. Makovecz insists that it is the spiritual drama of his forms that is important. "For me, building is the mark of God, architecture should find a function that ties together the earth and the sky. Through the forms of my buildings, I want to suggest an alternative way of life". Accompanied by the haunting music of the Estonian composer, Arvo Pärt, slides of Makovecz's work since 1960 lit up the lecture hall – a harmonious marriage between two forms of art that are both soulful and stirring. *KM*

ARCHITECTURE AND DESIGN COMPETITIONS

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

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

USA
Greenport Waterfront Park Open to architects, planners, landscape architects, engineers, student-faculty teams and students. Multi-disiplinary teams encouraged. Innovative design ideas for a four-acre park and harborwalk. The landscape will

incorporate various architectural pavilions, a carousel, community facilities and dock master's offices.
Registration by 19 October 1996. Submissions by 15 November 1996. Professional advisor: Wendy Evans Joseph AIA.
Tel: +516 477 3000.
Fax: +516 477 2488

EXHIBITIONS

AUSTRIA
Ingenious Failure – Unrealised architectural projects in Austria 1699-1920.
11 June-13 October, 1996. This exhibition examines the discrepancies in the Austrian building culture with reference to key built and unbuilt projects by architects such as Johann Bernhard Fischer von Erlach; Otto Wagner and Adolf Loos. MAK Austrian Museum of Applied Arts. Stubenning 5, A-1010 Vienna. Contact Gabriele Fabiankowitsch.
Tel + (1) 71 136 298

FRANCE
Nouvelle architecture en Flandre
20 June-24 November 1996. Arc en Reve, Centre d'architecture, Entrepot, 7 rue Ferrere, F-33000 Bordeaux, France. Tel: +33 05 52 78 36. Fax: + 33 05 56 81 51 49

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

USA
Philip Johnson 6 June - 3 September 1996. An exhibition to celebrate this architect's ninetieth birthday and his role as a curater and donor to the museum. MOMA in New York. Tel + 212 708 9400

EXHIBITION-PREVIEW

Gaetano Pesce Exhibition: 3 July-7 October 1996
Centre Georges Pompidou-Beauborg, Paris, France

Floor plan of exhibition

"Walking through an exhibition should seem like visiting a city; you cannot see every detail at once, so you should just be happy to discover a part here and there" states Gaetano Pesce the acclaimed Venetian artist/architect. This is his explanation for the fact that one can only see 30 percent of his forthcoming retrospective "A Time of Questions" during the course of one visit. Due to open on 3 July 1996 at the Centre Georges Pompidou the show promises to be both intriguing and stimulating. Traditionally the arts have played a provocative role. This exhibition raises challenging questions that have informed Pesce's work over the last 37 years. They range from a critique of the state of art today, the possibilities of the role of the architect in the future and musings over the aging of the city.

The show will cover recent architectural/interior design projects, experimentations on synthetic materials, new research and distortion of materials. Pesce has breathed new life into the Sensaround concept. The floors of the exhibition space will be sprayed with the scent of minestrone and the exiting visitor will be offered ice cubes, a symbolic opportunity to lick and suck and consume the questions! *Susanna Sirefman*

EXHIBITION-REVIEW

100 Masterpieces – Furniture that made the 20th-Century
Until 6 October, 1996. Design Museum, London, UK

From an architectural point of view, chairs require no planning permission or huge material resources although, like buildings, they are functional, designed on a human scale and require some knowlege of physics and engineering. So do chairs show what architects would do if they could? They can certainly indulge their designer tendancies in a way that they can't when producing expensive buildings to client requirements in a public space.

Chairs from Dr Rolf Fehlbaum's (founder of the international furniture company Vitra) private collection are currently being exhibited in London. Despite the space restrictions in the Design Museum, Fehlbaum's collection covers 20th-century developments in: Technology; Construction; Organicism; Reductionalism; Decorativeness and Programmaticism under which headings the exhibits are grouped. The collection includes excellent examples of "architects' chairs" such as Philippe Starck's 1990 WW Stool; Coop Himmelbau's Vodol Chair 1989; Alvar Alto Chaise No 39, 1936; Marcel Breuer Chaise No 313 , 1932; Charles and Ray Eames ESU (Eames Storage Unit) 421-C 1949-1950; Eileen Gray E1027; Le Corbusier/Charlotte Perriand/Pierre Jeanneret 1928; Mies van der Rohe Barcelona Chair 1929 (*above*) and Gerrit T Rietveld Unamed 1942. *KM*

Seriously entertaining

David Rockwell's architecture is dominated by overtones from the entertainment industry. Linking his appreciation for theatre with his architectural training, Rockwell rode the recent recession and has emerged as one of America's commercial success stories. "Architecture as theatre" as he likes to describe it, is on the border of reality and fantasy, where the imagination is given solid form. Rockwell's designs create a dialogue between "anti-modernism" and "architecture as symbol" as the basis for an architecture of "faction". Graham Vickers went to America to trace the sources for the work of this extraordinary "theatrical" architect who has spawned Hollywood hybrids from Manhattan to Hong Kong.

Mature architects who found the recession tough going but who survived and managed to rebuild their firms might well look at 40-year-old David Rockwell with some bemusement. Here is an architect who has achieved commercial success on a quite staggering level. The 90-strong firm of Rockwell Architecture, Planning and Design has worked in Tel Aviv, Jakarta, Hong Kong and Shanghai as well as Dusseldorf and London, not to mention Atlanta, Florida, Las Vegas, Los Angeles, New Orleans, New York... the list goes on.

As a result Rockwell can be hard to pin down at his Manhattan headquarters on Union Square West, since he is most usually to be found somewhere else. He might be at one of the world's Planet Hollywood restaurants, almost all of which his firm has designed. Or at Disney World, a Sony multiplex in Michigan or a new casino in Connecticut. Yes, Rockwell is into entertainment architecture, or, as he likes to put it, "architecture as theatre". Restaurants, clubs, bars, hotels, retail, offices and residential clients are waiting in line for his services. His already substantial firm could now expand, and probably would do if he were not concerned about losing control of the design process.

"My initial passions were theatre- and music-related" he says. "My mother was in the theatre and I worked in the theatre as a kid. I also studied piano pretty seriously for two or three years."

This was in Guadalajara, west central Mexico, a health resort to which his family had retired and a city not particularly renowned for its theatrical connections. Chicago-born Rockwell made a 2,000-mile move back to the US to attend Syracuse University, partly to study architecture and partly because he wanted to be near New York's theatre community.

"I was always looking to link theatrical experiences with architecture" he recalls. "Even at Syracuse University – which was a pretty strict modernist education – I was interested in pushing the envelope towards theatrical architecture. As a result I was very interested in an anti-modernist approach and the idea of architecture as symbol. It was pretty clear to me that was what I wanted to do".

A stint at the Architectural Association in London followed.

"Going to the AA for a year was very fortunate" Rockwell says. "Having a chance to sit around and talk, listen and be open to a whole new set of influences. The only thing that they resist there is actually working."

Rockwell does not resist working. He does little else. In retrospect it may seem a logical development for him to have become the doyen of leisure building design. However it must have looked like a long shot at a time when he was a student and the sector was less well defined. consultant. By now he was already intuitively pursuing an approach that he still favours: not looking for work but actively seeking projects in which he wanted to be involved.

Swimming against the conventional architectural tide, Rockwell was never particularly concerned about what other architects thought of him.

"I was not looking for clues or acknowledgement from my peers" he says. "I was looking for clues and acknowledgment from my clients."

His role models are to be found some distance away from pure architecture.

"When people ask who my influences are, I say we take lessons and inspiration from set designers and the movies" he says.

Indeed, if Rockwell has a style then it lies in his personality not his work. Of course purists might laugh at the very notion of architectural style existing in the world that many of his projects inhabit, but part of Rockwell's success is due to the fact that he understands and embraces such projects on their own terms and then seeks to extract some originality, not impose it.

"The rules of the game were to solve the problem by relating to everyone else's rules"

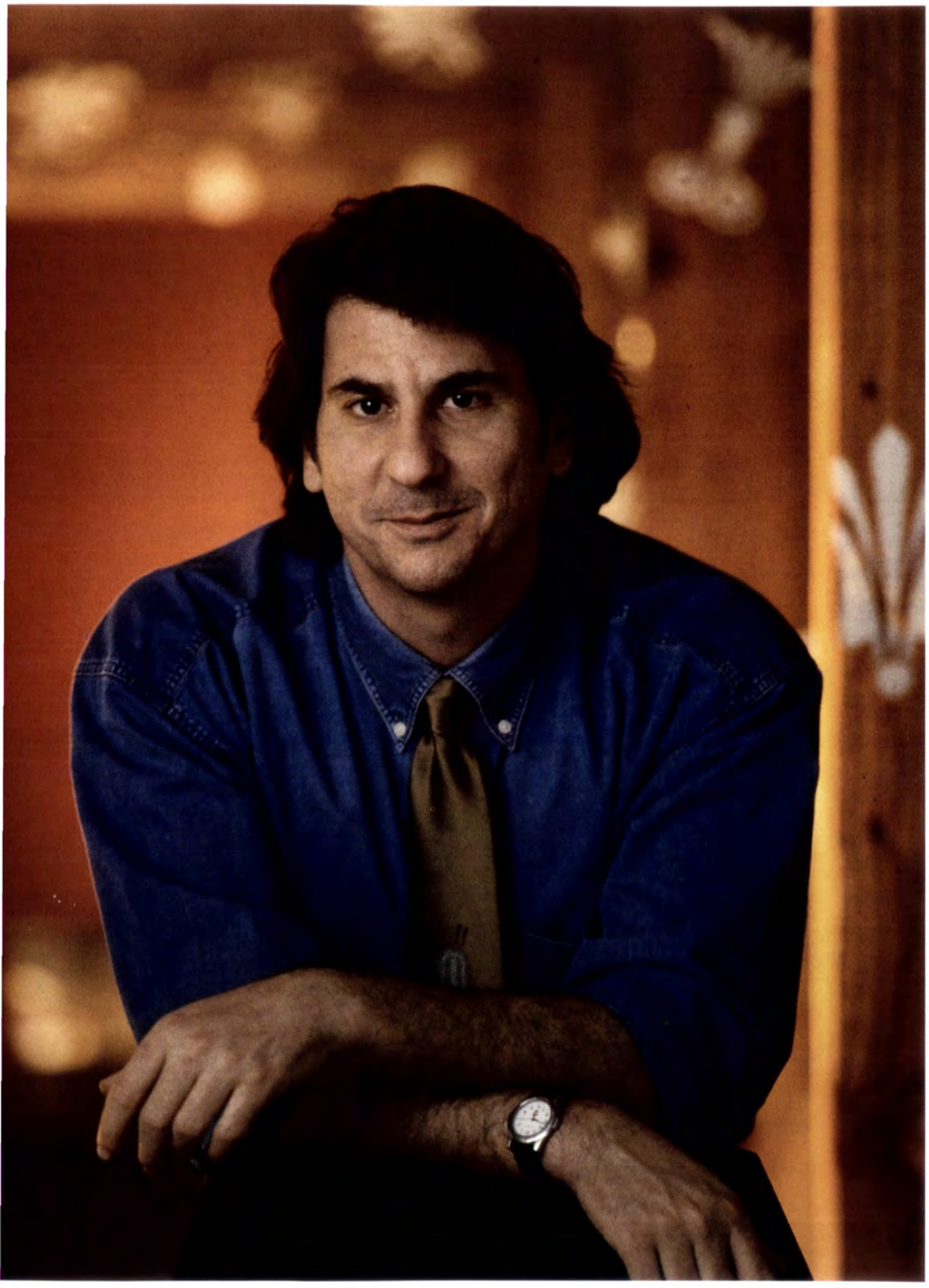
"At Syracuse several professors were instrumental in encouraging me, and when I had an opportunity to do a historical thesis in urban planning, I did it on Times Square. I think I was always just following instincts and putting pieces together".

A summer job working for a theatrical lighting designer resulted in Rockwell assisting on a Broadway production of Dracula that subsequently won a Tony for the best lighting. This experience suggested a practical way of linking his architectural studies with his personal enthusiasms and Rockwell subsequently worked for one year as an architect and another as a lighting

"It may be more comfortable to go into a project knowing what the outcome is going to be, but we draw influences from wherever they may be. If you look at some of the architects who are doing work with Disney now you might think they would have trouble weaving in a narrative piece that's something other than their own statement".

Rockwell has no such difficulty, since his own statement always consists of reinterpreting the client's statement. It is a talent he was exploiting even back at Syracuse.

"In college if I was doing a project, the rules of the game would be that you would have to solve the problem you



were setting for yourself in a way that related to everyone else's rules. You have to be smart enough to do that. You have to understand what all the questions are going to be."

Asked to identify a favourite project he finds it difficult.

"I'll give you two" he says at last. "One would be Nobu which is a small Japanese restaurant in TriBeca, here in Manhattan. Americans have been desensitised to what a Japanese restaurant is, so you get screens, mats, a few other things. We re-examined that. We looked at kabuki theatre. We looked at the Japanese countryside. We looked at the nature of the food, which is mainly about the translucent quality of the raw fish. And out of that we developed this kind mythic Japanese landscape.

"The other would be Planet Hollywood which certainly is about as pop as you can get in terms as a cultural piece. I think it very successfully creates what I call a fantasy-based fantasy. Unlike a lot of what Disney does it's not reality-based, it's a collage of images evoking the world of the movies without literally recreating any one piece."

Another major current project – a 515,000-square-foot casino complex – illustrates his favourite working method. The Mohegan-Sun Casino Resort sees the developer of South Africa's Sun City coming to Connecticut with an ambition to build a gambling paradise themed on the cultural past of a local native American tribe – the Mohegans.

"This tribe had no buffalo, didn't live in teepees and were friendly with the white man" Rockwell reports. "We got the one tribe that lived off the land".

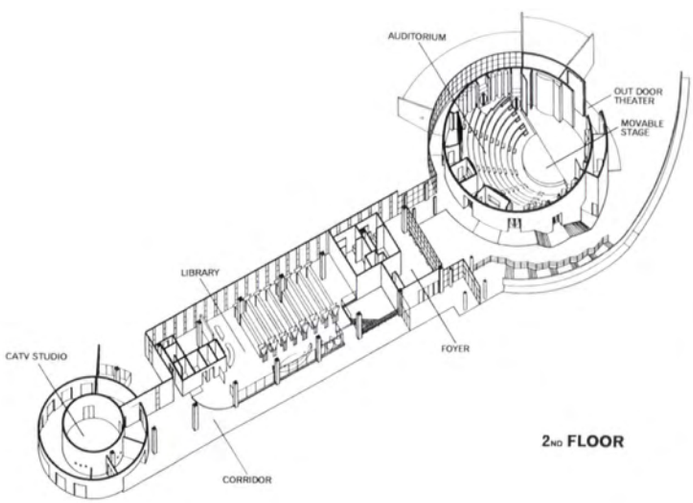
Undaunted by the shortsightedness of a people unable to anticipate their future potential as theming, Rockwell spent a week with the tribal historian, discovered that the Mohegans were dominated by the seasons, and found a suitable approach.

"We put together all the tribal stories and divided the casino into quadrants, with these big band shells high over the space to announce each season. I think it's going to be very interesting". **WA**

Project Review

Tapcopian Plaza, Takko, Aomori, Japan

Architects: Shizuo Harada, ESCO Co Ltd, Tokyo
Text: Georgi Stanishev



2ND FLOOR

The Tapcopian Plaza was conceived and built as the main public facility in the town of Takko, a small settlement at the end of Honshu Island with a population of only 8,000. Its name originated from the tapcopu, which in the language of the local aborigines, the Ainu, means "the rolling hill".

The town of Takko, as with all other small settlements in the Japanese countryside, has the problem of a continuously decreasing youth population, due to metropolitan migration. One of the strategies for the preservation of the rural population, is the development of multi-purpose civic and cultural centres as public attractions.

The Tapcopian Plaza is a small complex comprising a CATV studio, a library, a conference room and an auditorium with 450 seats. The CATV studio is a double-functioning unit which aims to illuminate the outside world to the people of this isolated mountain settlement. It works as a re-translation station for TV programmes from the large Japanese cities, as well as a production and broadcast studio for local programmes on weather forecasts, cultural and political events, and matters of regional importance.

The forest-like library has huge wooden supports and is conceived as a transitional space, a corridor where readers can enjoy the books whilst sitting on the floor, and passers-by can be in closer contact with literature.

The auditorium, with a semi-spherical roof, is designed to keep the distance between the audience and performers at a minimum. The back of the stage can be opened up and its shape changed according to the need of the performers. Its space unveils the metaphoric image of woods, green slopes and stars in the sky.

While the spatial composition of the complex is based on rational principles, its volumetric imagery shows the hidden potential of formal freedom; with its wing-like roof and the correlation of both circular forms and open chains of non-direct organic associations. The Tapcopian Plaza is situated in a wide park area on a hill, thus its top forms a modern acropolis and a symbolic place to dispatch messages to the small town community. **WA**

Opposite page *Exterior view of the Tapcopian Plaza, a multi-purpose cultural and civic centre which forms the principle public facility of the town of Takko.* ***Above*** *View over Takko, with the "rolling hills" of Honshu Island in the distance and the semi-spherical auditorium dominating the foreground.* ***Right*** *Interior view of the 450-seat auditorium.* ***Below, clockwise from top left*** *Exterior view towards the CATV studio. The wing-like form of the roof and the dome of the auditorium illustrate the rational volumetric composition of the complex. The Tapcopian Plaza is situated in a wide park area. The auditorium has the capacity to change shape according to the needs of the performers*

Gallery

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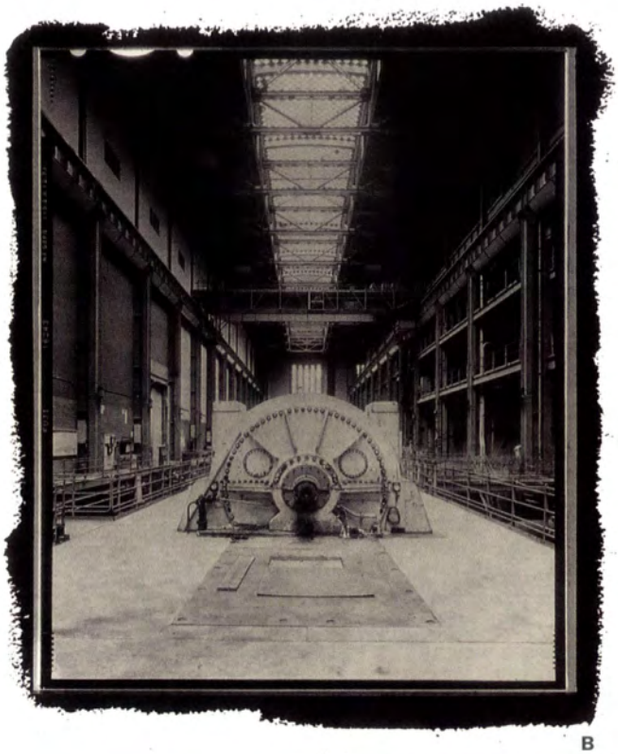
Photographs of Bankside Power Station, London



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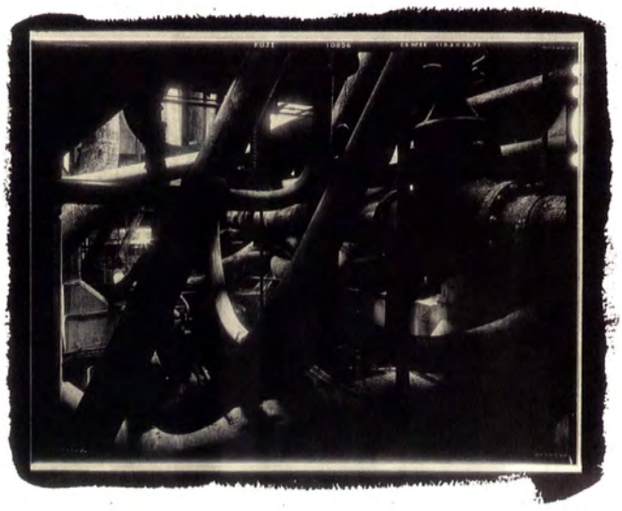

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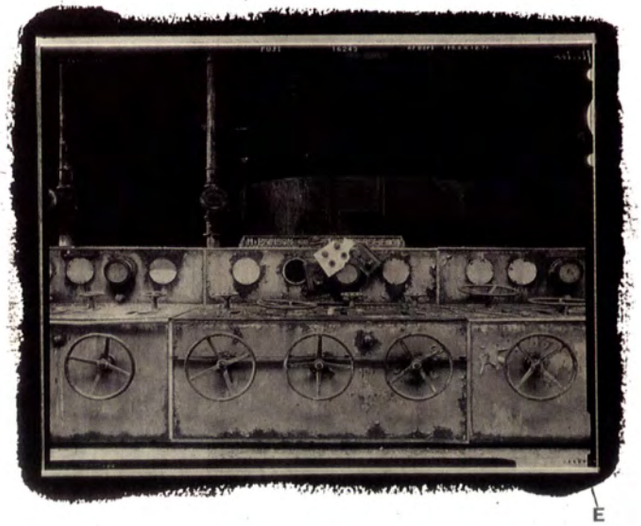

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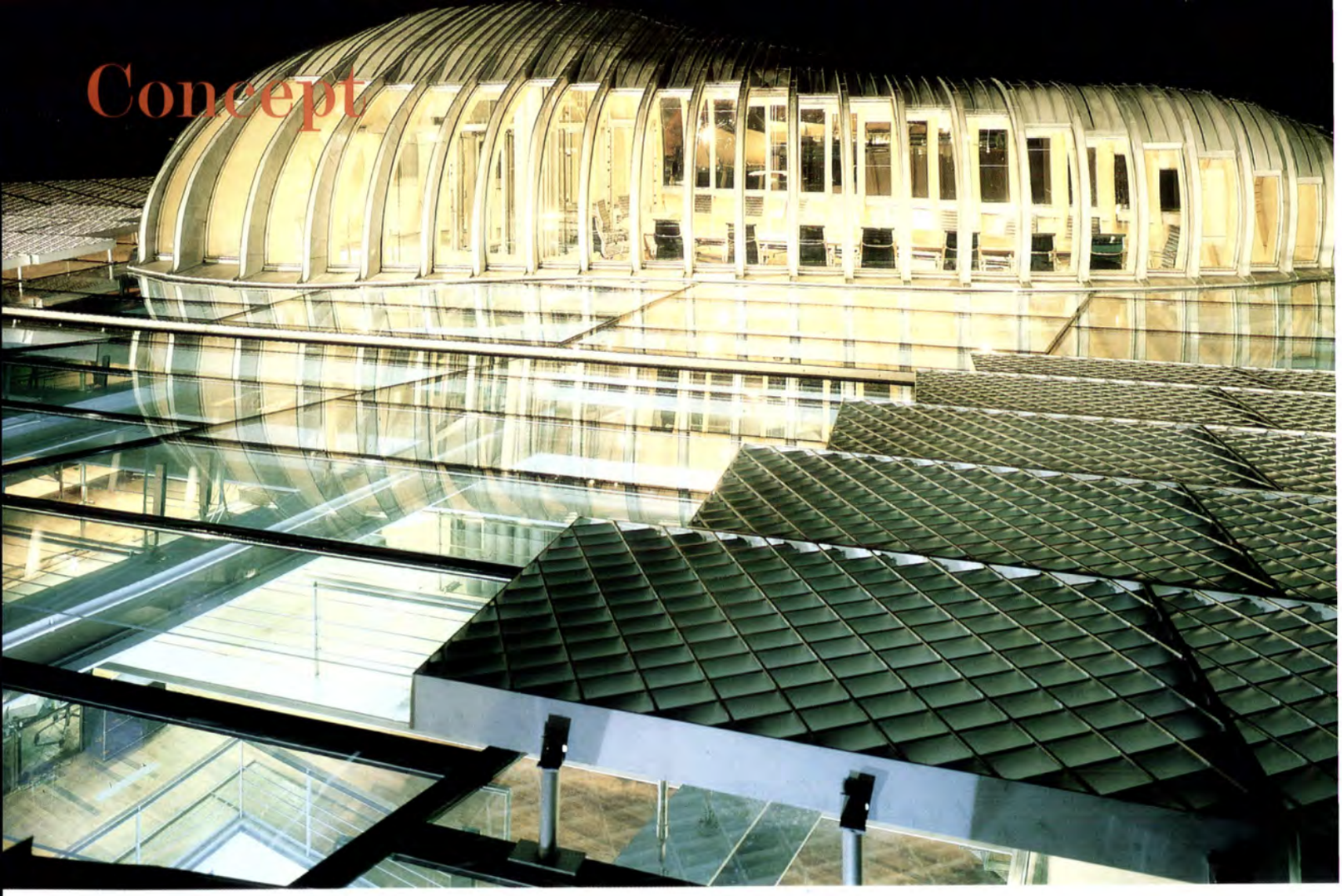
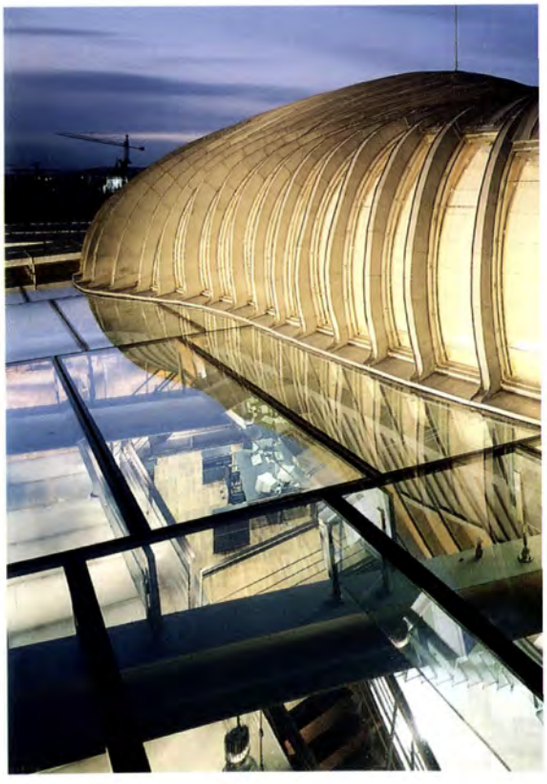


Soft-Modernism

Contemporary Dutch architecture is strongly related to its modernist heritage. But while some designers make use of it through neo-revival and reproduction, others take modernism as a point of departure seeking for new paths and innovative modifications. Here, Erick van Egeraat, in an interview with Georgi Stanishev, explains his interest in pursing the juxtaposition of uncompromising modernism with intuitive organic shapes towards a modern baroque.



Opposite page and bottom *Urban Study Bijlmermeer, Amsterdam, 1994*
The area of "Bijlmermeer", built in the 1960's as an embodiment of the "ideal city", is being renewed. In order to relate the apartment buildings to the low-rise housing, a series of intermediate housing blocks were placed in between. The configuration of this intermediate stage resembles ancient landscape relics such as the sculpture group on Paasisland or Stonehenge. These organic blocks perform an important aesthetic function and represent the architect's intention to create "objects of desire". The housing typology is diversified and flexible in order to enable different family groups to live there in different ways. The surface of the dwellings in this study varies from 70 to 135 square metres. The facades are made of small wooden strips (60 x 15 millimetres). Large parts of the facade can be opened with hinged shuttered windows

Below *Nationale Nederlanden and ING Bank Headquarters, Budapest, 1994*
The traditional courtyard of a renovated nineteenth-century office building is covered with glass roof. An organically shaped boardroom – a glass "blob" is located on this roof. The blob, or the "whale", is built up of 26 laminated timber frames that are hung on a steel load-bearing structure which in turn supports two concrete floors. The skin, built up of orthogonal battens, refers to ship-building techniques. The skin uses about 103 different glass elements and the glass roof uses 483. The laminated glass beams of the roof support the transparent sea of clear glass in which the whale comfortably floats

Formerly with the avant garde Dutch office EEA, Erick van Egeraat set up his own practice to develop a unique brand of vital and emotional architecture. This new firm focuses on achieving a stylistic equilibrium between the analytical, the conceptual and the sensitive, even sensual. He combines rigid reason and logic with soft, sculptural poetry, resulting in an almost liquid formation of the architectural space. But in spite of its exotic appearance his architecture is also deeply rooted in Dutch modernism of the first half of the century.

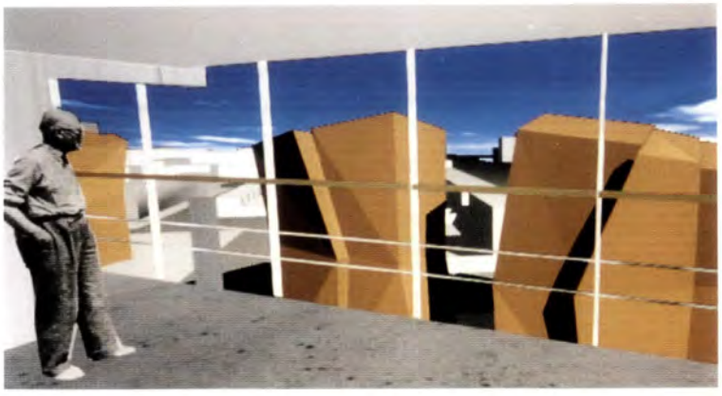
The challenge to resolve the question of how to be modern and contextual in the same time, is central to Erick van Egeraat's work. His use of consciously developed counterpositions is reminiscent of the principles of inversion in mannerism and baroque. This developed into a personal expressive system where human sensitivity is reintroduced into architecture through soft but abstract shapes, without resorting to historicist nostalgia and revivalism. Thus, most of van Egeraats projects reveal a sense of rigorous modern architecture that has undergone a softening "melting" effect of a sensual attraction.

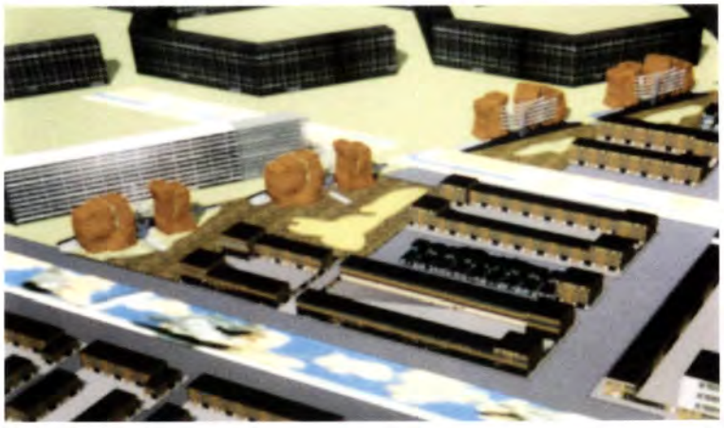
In the following interview, Erick van Egeraat outlines his current search towards an architecture of intelligence and sensitivity.

Georgi Stanishev: What is the role of the Dutch modernist background in the formation of your architectural attitude?

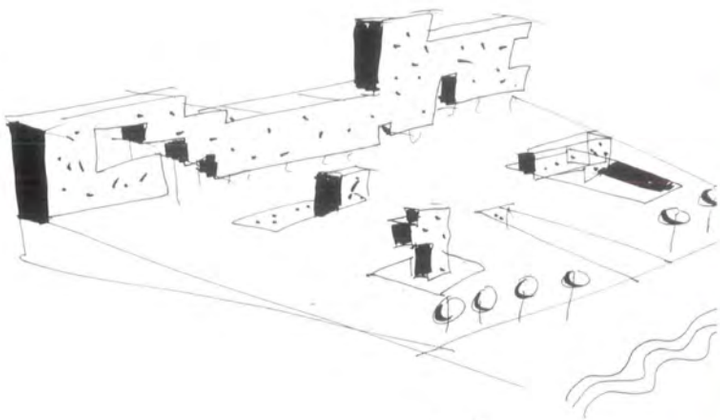
Erick van Egeraat: Nobody today would believe how undeveloped The Netherlands was when I was younger. Empty, cultureless and naively open to any novelty, as long as it seemed to be "modest" enough. That is why, in the fifties, the rush to catch up resulted in a cult of minimalism. But the essence of Dutch philosophy, the sense of proportion and balance, was lost. The abstract social models that architects applied to new urban areas were entirely unrelated to the hierarchical structures and lifestyles that existed in the old cities.

That is why I want my work to relate to the cultural and the historical context as a source of meaning and





Right and opposite page bottom *National Dutch Radio and Television (NOS) 1995-96 The NOS project houses the programme of the new National TV and Radio centre in two buildings: one for the administration offices of the staff and board (GSD), and one for radio and TV editorial staff (RTV). The office building (GSD) is orientated with its brick skin towards the road and the Mediapark. The glass-wall facade faces the park linking inside and outside through the main reception hall of the building. The Radio and TV building (RTV) is a composition of volumes, grouped around a central space and connected by an undulating roof. Offices from the existing building "Heideheuvel 1", remain practically intact*



Top, above and above right *Housing "an der Elbe" Dresden Kaditz/Mickten, 1994 Situated at an elbow of the river Elbe and the Berlin highway intersection, the site offers excellent opportunities for the development of offices, small industry, housing and open space. On the south-side of the masterplan a wall of housing overlooks the Elbe river and Dresden's old centre. The proposal changes the "wall" of the existing housing into a "wall & carpet" conception, with the addition of a carpet in one of the family housing units with patios. The "wall" itself was transformed through variations in its height and large perforations along its 350 metre length. This enabled the development of housing, studios, offices, boutiques, winter gardens and roof terraces with small swimming-pools, and windows offering a view of the river and allowing direct sunlight to enter in the street in the south side*

human reflections. But, at the same time, I believe that all architecture of historic significance was modern at the time it was built, emerging from its own time and culture.

That perhaps explains my earliest obsession with the question of why early twenties modernism was so misused in the post-war period. It seems to me that modernism started as a profound search for the essential, but was transformed later into a mere cultural minimalism. It became a surrogate, that seeded the endless number of styles which followed one after the other after modern architecture was declared dead in the seventies.

What, then, is your personal strategy?
In my first projects I tried to return to the roots of Dutch modernism in order to recreate it in a new soft version, that could relate to the culture of the site, and of the city. This idea is not just a product of my interest in relativism, it is a question of the "appropriateness" of architecture. Design has to trace the dynamics of its own era, without transforming itself into a cool, rigid, and souless container.

Now I am less preoccupied by this question. For me it is more tempting to try and mark my own time and space. In this respect I am trying not to state but to relate – not to consider,

but to seduce and to make things "beloved". I hope to create a sensual and intuitive architecture.

How does this intuition work in the search for a design concept?

Most of the concepts come to me as clouds on a clear sky. When I diagnose a problem, I try to capture and fix down the sensation of the moment. I try to perceive the needs and the wishes of the project itself. There is an enormous pleasure in finding a poetic statement – a witty seed which can grow as the project develops.

Intuition is developed by learning from experience, either my own experience or what I perceive in the work of others – the links and proportions of things influencing one another.

Which "others" are you referring to?

Well, for instance, the work of Le Corbusier helped me to understand that the avant garde must correspond to cultural orientations and assessment systems. I imagine that the great master watches proceedings and I let his figure haunt my buildings. I feel that I perceive my own work through his eyes. It helps my choices and catalyses my intuition in generating forms and spaces.

You have been in Prague, you built in Budapest, what do you consider as challenging in Eastern Europe?

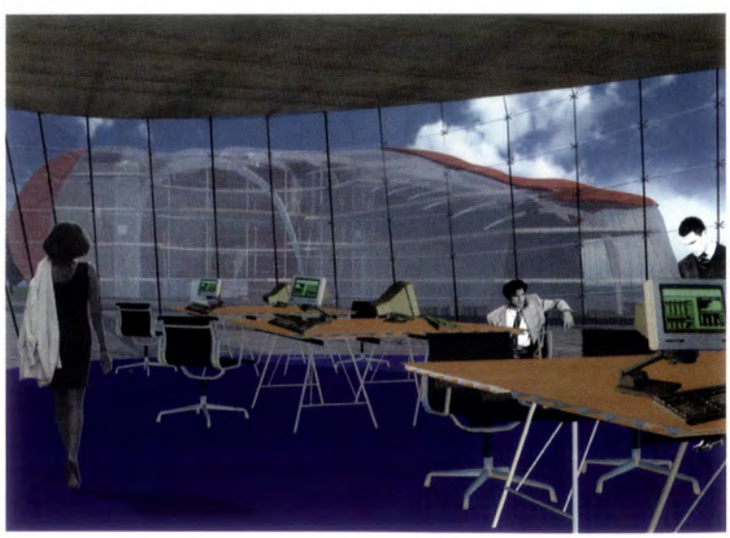
After my first visits to Prague five years ago I realised that its unspoiled cultural richness originates from the same era in which my own country's architectural achievements were so poor. The same rich and well developed eighteenth and nineteenth-century culture can be found in Dresden, Vienna, Prague, Budapest and elsewhere in this part of Europe. The cities of Eastern Europe, with their rich architectural heritage, remain relatively untouched and unspoiled. The biggest challenge for Prague now is to convert the city into a new, inspiring experimental zone.

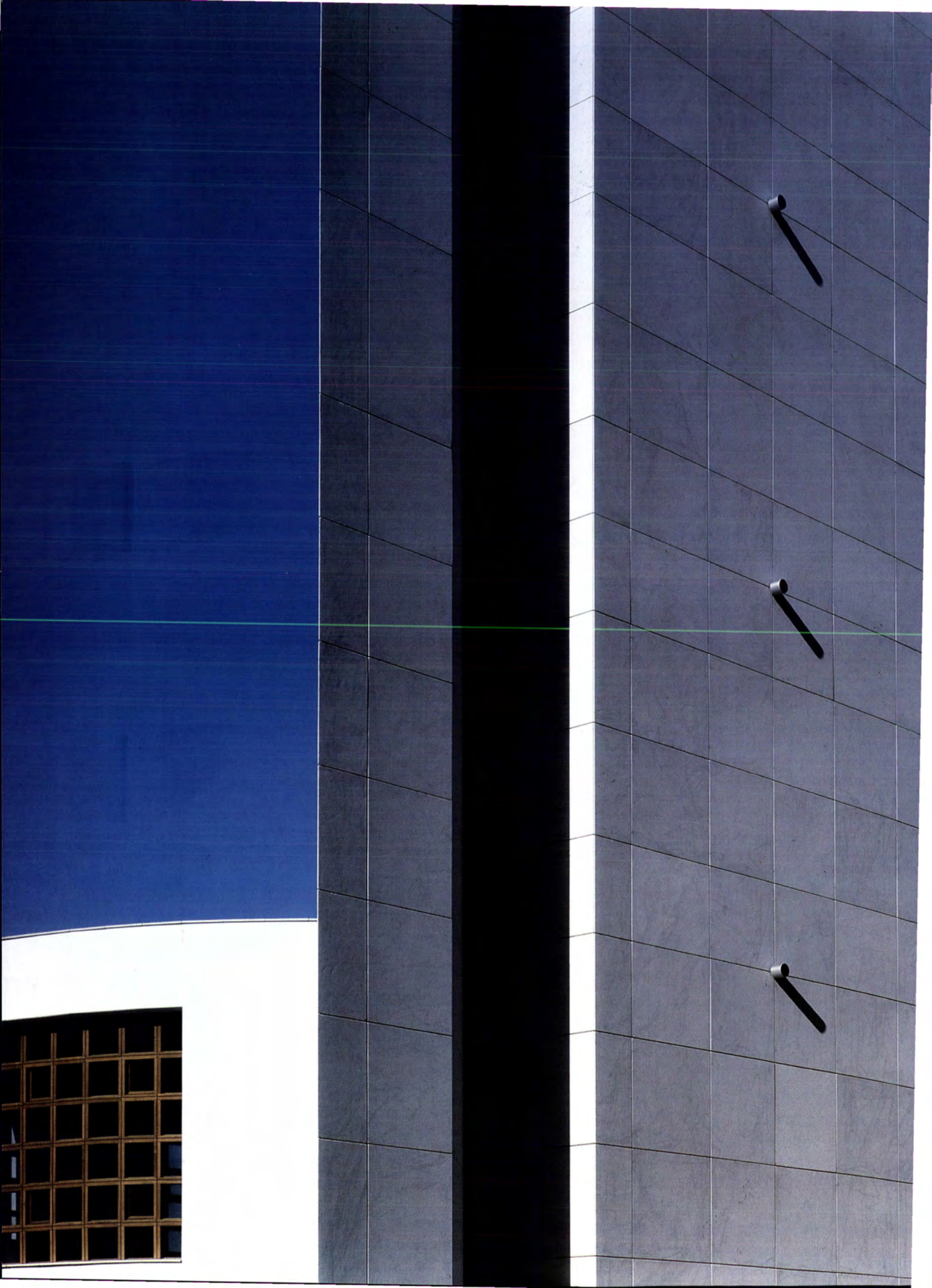
Is this what makes contemporary architecture interesting for you?

Ten years ago I would have answered that I believed in an architecture that is capable of responding to given local conditions and that I did not believe in style. I cannot think like this anymore. Architects cannot pursue a style, a personal expression is the result of a search for new sensations.

Buildings can be considered to be unique products since the solution to any given context can be different. However, there are many similarities in design problems.

I hope to develop an architecture which corresponds to a known language with new emerging sensations in order to capture a life which is ahead of us. **WA**





Benelux

It's easy to be dismissive of the Benelux, the economic union formed in 1944 by Belgium, the Netherlands and Luxembourg, and consolidated in 1960 as the first truly free international trade zone. They are three of Europe's smallest countries, divided between speakers of five languages, with a reputation for monotonous landscapes and uninspiring cities. But these countries are not only intrinsically interesting in terms of their contemporary architecture and urban development; in several senses, they are the heart of the emerging European Union. Peter Wislocki constructs theories about the industry in the Netherlands and Luxembourg, and Georges Binder, of Buildings and Data in Brussels, tests the temperature in Belgium.

There are, of course, vast cultural and topographical divides in the Benelux region. Very roughly speaking, the Netherlands and northern Belgium are flat, densely inhabited lands, interrelated by language (Dutch and Flemish are Germanic dialects), and, to a less tangible extent, a work ethic which owes something to Dutch Calvinism, nurtured by centuries of international trade and battles with the elements. The southern half of the Benelux is Francophone and culturally (though not politically) Francophile, more rural and picturesque, more conservative and less conspicuously entrepreneurial.

In terms of their architecture and urbanism, there are equally strong distinctions. The Netherlands has a strong tradition of socially and technologically progressive modernism, and currently boasts several of the world's leading architects and theorists, including Aldo van Eyck, Herman Herzberger and Rem Koolhaas. Notwithstanding the imperative of preservation of its historic centres, particularly in Amsterdam, modern architecture enjoys official patronage and apparent public support. This is not so obviously the case in Belgium and Luxembourg, which (despite the potential inspiration of Horta's work in Brussels) have no comparable design cultures. The overwhelming character of these two countries is corporate and conservative: big money making big, often vaguely classical, nondescript buildings. But, as the projects in this issue show, exceptions are to be found.

Being the most ardent Euro-enthusiasts, it is hardly surprising that the Dutch, Belgians and Luxembergers have developed similar responses to the legislative and commercial forces of the European Union. Throughout all three countries, the public sector seldom commissions new building projects directly, leaving the production of the built environment largely to private capital. This has two significant consequences. Firstly, there are great opportunities for property developers and entrepreneurial designers to work on the most prestigious of infrastructure projects. (All three of the major projects illustrated in this issue are "public sector", yet all were designed by independent consultants, and two were financed by private developers). Secondly, by avoiding direct public sector investment, the EU's directives requiring open, international competition are subverted. The absence of competitions has not prevented numerous foreign architects from working in the Netherlands and Luxembourg, although few have found work in Belgium. Among others, Richard Meier, Michael Graves, Robert Venturi, Aldo Rossi, Kohn Pedersen Fox and Skidmore Owings and Merrill all have current, or recent, Dutch projects. Kisho Kurokawa's Catholic University project near Brussels is also about to go on site; and Meier, alongside several German practices, have finished new corporate headquarters buildings in Luxembourg.

About 50 percent of Belgians and Luxemburgers are believed to speak a foreign language fluently. This linguistic achievement is second only to the Netherlands, where 75 percent of the population aspire to fluency in at least one foreign language (invariably English – though French and German are also widely spoken). These three countries have developed through international trade, and all actively encourage inward investment. There are no currency restrictions within the EU; and professional qualifications are mutually respected. In all three Benelux states architects must be officially registered to use their professional title; but any competent individual (not necessarily an architect) may apply for building permits.

The power of the Dutch state to direct development is perhaps greater than elsewhere in Europe, largely due to the historical – and continuing – scarcity of land. It seems only reasonable that authorities which create new polders should have a high degree of control over their utilisation.

The system of building procurement in Belgium and the Netherlands is most akin to the German or British models, traditionally fixed-price contracts, with full technical responsibility taken by the designer, whilst in Luxembourg (and in the case of some Dutch practices, notably OMA – Office for Metropolitan Architecture, Rem Koolhaas and Bruce Mau) a variant of the French approach has been applied, devolving technical responsibilities to other consultants. Design and build is generally used only for the most mundane of jobs, such as industrial buildings and housing – with the notable exception of CEPEZED, whose unique working methods were discussed in *World Architecture 34.* Culturally, if not always commercially, these markets should be most inviting to outsiders.

Opposite page *Library of Human Sciences, Free University of Brussels, Belgium by French architects Art & Build*

Right *Design by Palmboom & van den Bout for a new urban extension area incorporating 18,000 dwellings on an archipelago of six artificial islands in the IJmeer – the innersea east of Amsterdam.* ***Below*** *Housing scheme by CEPEZED on the south bank of Maas, Rotterdam*

Peter Wisloski

Netherlands infrastructure

Transport infrastructure has recently become a prime concern in the Netherlands. The country already has the world's densest network of motorways, linking the Randstad cities of Amsterdam, Leiden, the Hague, Delft, Rotterdam and Utrecht, and extending across the national borders to Belgium and Germany. The railways also provide frequent and efficient passenger services to most larger towns and cities. A high proportion of freight is carried by inland waterways.

Transport is seen as the key to national prosperity and wellbeing. Rotterdam remains the busiest port in the world, far bigger than any north-west European rival; and Schipol is fourth in the league table of freight shipments through European airports. From these two gateways, 80 percent of the continent can be reached, overland, within 24 hours. Transshipment of goods is a key national industry, meriting public investment.

The government's approach to transport planning has become more systematic of late. The recently published *Fourth Report on Physical Planning* defines policy, "to ensure that businesses and services with a high potential of public transport utilisation by employees and visitors are sited in locations which are easily accessible or which can be made easily accessible to public transport". The policy is pro-active, and is being implemented iteratively: where appropriate, infrastructure is being developed to match existing land uses; otherwise, planners direct new uses towards existing infrastructure. Following this intuitively simple principle, a detailed system of classification of mobility and accessibility profiles is being introduced, effecting all future planning decisions.

The tangible products of these policies include a rolling programme of improvements to the motorways (widening from two to three lanes), and a number of new suburban railway stations and interchanges. The majority of this work is being carried out within the nationalised industries concerned, but a few stations have been designed by independent consultants. The continuing improvements at Schipol, integrating air, road and rail transport, are being led by Benthem Crouwel, in a joint venture with the public sector NACO design team.

The largest single project, awaiting imminent political affirmation, is the extension of the high speed railway line from Brussels and the Channel Tunnel, through Rotterdam and Schipol (with the possibility of a station in the Hague), terminating at Amsterdam RAI in the southern suburbs of the city. The proposals have stimulated public debate, controversy being aroused by the necessity of omitting stations in many urban centres in the interests of higher speeds and shorter travel times. The Dutch government has come down firmly in favour of the French TGV system, despite its requirements for dedicated, and environmentally isolated, tracks.

Having masterplanned the TGV-based development at Euralille, OMA are widely tipped to win the commission for any comparable schemes in the Netherlands.

Housing in Holland

The Dutch population, currently about 15 million, is set to grow to 16 million by the turn of the century, and is expected to continue growing, albeit at a slower rate, until 2015. The Randstad continues to attract migrants, from within the national borders and beyond. Thirty five percent of Amsterdam's youth are members of ethnic minorities. Demographically, housing must respond to the trend towards smaller households. Currently 50 percent of dwellings are occupied by one or two persons; and the Ministry of Housing, Spatial Planning and the Environment believes the proportion will rise to almost 70 percent by 2015.

As a consequence, the Dutch government is planning for the construction of two million

Below *The striking form of Jo Coenen's Museum of Architecture in the new museum park in Rotterdam*

Peter Wisloocki

new dwellings over the next twenty years, with 500,000 to be built in the Randstad alone, by the year 2000. Having invested directly in housing over previous decades, the public sector is now privatising housing provision. Of Dutch dwellings, 53 percent are rented, of which the majority are owned by housing associations. Most Dutch housing is quite new – only 26 percent was built before the Second World War – as one might expect in a country whose land area has been artificially increased by 2500 square kilometres over the last 100 years. Despite scarcity of space, cultural preferences have limited the acceptance of high-rise dwellings. There is clearly a large new-build housing construction sector, with proportionately less demand for repair and maintenance.

The scale of projects, and their design quality, varies enormously. A small proportion is highly innovative, and designed by practices like OMA and CEPEZED, and monitored by government-commissioned advisors on experimental housing (SEV). In terms of their social programmes, Herman Herzberger's designs are seen as international benchmarks. The majority of schemes, however, are repetitive and programmatically conservative, as one might expect from the two dozen or so housing associations currently owning over 10,000 dwellings apiece.

The Dutch government is coordinating major developments of housing in the Randstad (notably through the VINEX initiative), and has been offering subsidies to developers, encouraging financial institutions to invest in this sector, principally in the densely populated, and rapidly growing west of the country.

Dutch urban regeneration

Alongside the development of new housing, partly on recently reclaimed polders and within designated new towns, national policies include the regeneration of the centre of the largest cities. Projects are invariably financed by the private sector, but guided by the planning system – founded on the 1965 Physical Planning Act – which appears to combine effective coordination with local consultation. Regional plans are agreed between national, provincial and municipal administrations; and any group or individual has a right of appeal or objection.

The regeneration of large, inner-city expanses of Rotterdam, and the creation of a new quartier, entirely on reclaimed land east

Top left *Samyn and Partners' Dupuis project in Marcinelle, Brussels, displays an ecological approach to thermal and physiological comfort.* ***Above*** *The Brussimo project, also by Samyn and in Brussels, was one of the first double-skin office buildings in Europe. The Crescent, by Assar architects* ***left*** *and the Espace Beaulieu, by Atelier d'Architecture de Genval* ***opposite page*** *are both occupied by the EU on the outskirts of Brussels*

of Amsterdam's existing centre, are prime examples of flagship schemes, driven by the Randstad's desire to compete with London and Paris as a world business centre.

In Rotterdam, the completion over the last decade of a new museum park, with buildings by Jo Coenen, Rem Koolhaas and Hubert-Jan Henket, is being followed by the regeneration of disused docklands, on the south bank of the Maas. Redundant warehouses are being converted into housing, supported by a variety of leisure and recreational facilities. A new bridge will link this area directly to the existing city centre, making it far less remote than, for example, London's equivalent developments on the Isle of Dogs.

The Dutch capital, perhaps due to its greater cultural and commercial conservatism, has found it more difficult to marry public and private sector initiatives in its city centre. Amsterdam's current expansion is centred on the Nieuw Oost, an expanse of reclaimed land roughly three square kilometres in area, linked to the city centre by high speed tram lines and new trunk roads. Plans for the scheme are still not finalised, but should incorporate a mixture of land uses, within a characteristically manicured landscape.

Investing in the heart of Europe

In the late eighties and early nineties, many hotels and apartment buildings, as well as speculative office buildings, were built throughout Belgium. Today, hotel construction has almost come to a complete halt and fewer offices are being built. Major investors include AG, Royale Belge, P&V, AXA, ING Group and Cofinimmo which is doing a renovation project with Helmut Jahn. Leading developers are Bernheim-Comofi, CIB-Immobel, CDP-Compagnie de Promotion and Codic. Projects are also developed by contractors such as Bâtiments et Ponts Construction, Besix, CFE, Herpain, Louis De Waele or Maurice Delens and others. The new Citibank building in Brussels designed by Bureau d'Architecture Henri Montois, CERAU and l'Atelier was developed by a joint venture between Bernheim, Besix, Delens, De Waele and CDP.

Foreign access to Belgium

With the exception of Skidmore Owings & Merrill in the 1960s, Belgians had to wait until the late eighties to see foreign architects working in their country: Ricardo Bofill in La Hulpe and Richard Meier in Antwerp and Michael Graves whose Hyatt Regency Antwerp is under construction. US architects Kohn Pedersen Fox are responsible for a redevelopment programme of a 30-storey building in Brussels. These projects are being done in association with a local partner. Sir Norman Foster has a project at the Sea Life Centre in Blankenberge and fellow UK architects Chapman Taylor Partners have designed a shopping centre for Louvain-la-Neuve.

However, foreign ventures are not always a success story. A couple of years ago the Walloon Region organised an international competition for its Parliament to be erected in Namur, and they chose Swiss architect Mario Botta. The way the competition was handled provoked disapproval from the "Ordre des Architectes" and still the Parliament remains unbuilt for planning and political reasons. But

a very successful competition for the "Reconstruction of an Historic Street in the Centre of Brussels" was organised in 1989 by AG's Christian Lasserre, who now heads CLI a leading real estate advisory firm, together with the Fondation pour l'Architecture. The project was completed in 1995.

Architects from an EU country are free to work in Belgium following the EU1985/384 Architects Directive. Architects wishing to register should call the Belgian "Ordre des Architectes" and request the registration form with which they should supply a copy of their existing architects registration documents, a copy of the mandatory professional indemnity insurance required for the project and the standard annual registration fee. Architects from outside the EU should contact the Ordre directly, as some countries have a reciprocal agreement for inter-recognition of qualifications.

Belgian office empires

In terms of end-users, the market is essentially driven by European and Belgian administrations. It is mainly Brussels which is the target for office projects. With few exceptions (Swedish Aränas; Dutch ING), most of the buildings built in recent years have been developed by Belgian private developers and investors. CDP is the leading developer involved in the Brussels downtown Espace Nord which started in the seventies and has witnessed its greatest growth throughout the nineties when the administration of the Flemish Government settled in the Noord Building, and Euroclear created by Morgan Guaranty Trust decided to build the 84-metre 151 Boulevard Jacqmain designed by Atelier de Genval and ELD partnership. Several projects were developed by CDP and its partners such as North Gate (60,000 square metres) and under construction, Graaf De Ferraris (43,000 square metres), both designed by Atelier de Genval and Bureau d'Architecture M Jaspers & Partners.

Brussimo, also in Brussels, designed by Samyn and Partners was one of the first double-skin office buildings in Europe, enabling a clear glass facade. Samyn's Dupuis project in Marcinelle is another way of developing such a trend, featuring a consciously ecological approach to thermal and physiological comfort. In Ghent, UCO was designed by modernist J Crepain.

The nineties is the decade of major suburban projects. Codic (owned by Dixons plc) is a leader when it comes to such developments. In the outskirts of Brussels, Espace Beaulieu with its 250-metre-long street-atrium, and The Triangles and The Crescent are all occupied by the EU. Atelier de Genval designed the first two, while The Crescent is the work of Assar. International companies are starting to settle in suburban quarters. In Waterloo, Codic successfully developed the 14-building Waterloo Office Park designed by CERAU and well integrated within landscape gardens. The project is next to the Sucrerie de Waterloo, a mixed-use development by Louis De Waele and designed by A+U.

The market has now shifted to more renovations of buildings completed in the 1960s and 1970s.

Housing the Belgians

There are a multitude of smaller developer-firms within Belgium: Van Belle is one of the developers at the upper end of the market, as is Immoflandria who won a MIPIM award at Cannes with Les Triades, a Brussels project designed by Marc Corbiau who specialises in exclusive apartments and villas. Ipeo is also a sound developer offering affordable quality apartments.

Public authorities play a major role in helping to set the scene, especially when it comes to semi-public companies developing housing projects at fixed prices for a public capable of responding to certain conditions. A good example in Brussels is the Rive Gauche scheme designed by French architects Art & Build. Rive Gauche is a mixed-use project including housing and offices and semi industrial units organised on the principle of horizontal layering, with lower levels devoted to light industry topped by offices sandwiched below housing duplexes. Art & Build became better known after the completion of the ULB Library for the Free University of Brussels. Art & Build is also involved with the design of a new housing project in St Géry in the heart of Brussels with CLI advising public authorities who often initially control the land while private enterprise provides the funds. Indirect involvement of the public authorities comes in the formula of "Charges d'urbanisme" which fixes a certain percentage of housing to office space built in the same locality. These units have to be put on the market at fixed

Below left and bottom *The Rive Gauche project designed by Art & Build, is a mixed-use project including housing and offices and semi-industrial units.* ***Below right*** *The Kinepolis cinema multi-plex in Brussels. Its success has inspired Antwerp's Metropolis complex*

prices. Former military sites are also being redeveloped such as Espace Rolin, a major project for housing in Brussels designed by Assar architects – the designers of the redevelopment of the École Royale Militaire and its housing units.

Generally speaking, in Brussels and Walloonia, mainly due to over-strict urban regulations, architects are forced to adopt more traditionally "conservative" designs than in Flanders where a more progressive Northern European modernism is emerging as exemplified in the work of Crepain. However, in Brussels the newly established practice of Gareth Pearce is giving international modernism a refreshing revival.

Belgium keeps one eye on the screen

Many downtown cinemas closed consecutively over a period of years before 1988 when Kinepolis opened its doors in Brussels to become, the following year, the world's largest multi-plex consisting of 25 movie theatres. This initiative, by the Bert and Claeys families, both Belgian private operators, was the first to introduce the mega-complex in Belgium on the edge of the city adjacent to the Heysel exhibition centre. The location is equally accessible to down-towners and out-of-town moviegoers, with ample free parking and metro station. Following its spectacular success, Kinepolis Group opened in 1993 Antwerp's Metropolis with another 22 screens. Bureau d'Architecture M Jaspers & Partners was involved with both projects, as leading partner in Kinepolis and through ES°TE in Metropolis. Jaspers is also the architect of the redevelopment of the Rex project in the heart of Antwerp. Imagimons, another multi-plex opened in Mons while a Kinepolis designed by ES°TE was recently inaugurated in Hasselt. The success of these multi-screen complexes had a positive global impact which has lead to new interest for cinema owners in city centre locations. The French UGC were the first to respond to this new trend in 1992 in the heart of Brussels with their expanded UGC de Brouckère incorporating the famous Art Deco Grand Eldorado. They are due to complete two more new movie theatres in 1996.

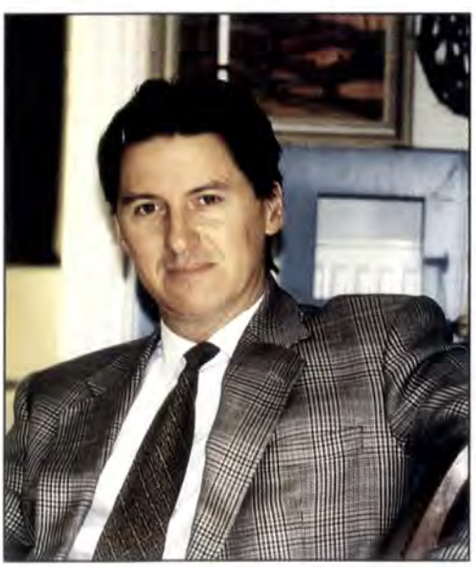
Abandoned theatres in the centre of Brussels like the Variétés which was at one time a state-of-the-art cinemascope movie theatre has been closed for more than a decade. It ajoins the Marivaux which may reopen in future with its next door neighbour the Plaza, part of the Hôtel Plaza also due to be reopened soon. Old movie theatres may recover from a long sleep, and reawake linked to a major hotel. Hotels will benefit from the new potential for low-cost developments in conference facilities in Brussels – which ranks in third place when it comes to international congress cities. **WA**

Atelier d'Architecture de Genval

in conversation with

Georges Binder

Below *André Jacqmain.* ***Bottom*** *Pim Robberechts*



Atelier d'Architecture de Genval, based in the Southern suburbs of Brussels, was founded in 1967 by André Jacqmain after the corporate headquarters of Glaverbel, a major glass producer, was completed. The building is now awaiting renovation by Atelier de Genval. More projects swiftly followed with academic commissions such as the Library of Sciences at UCL University in Louvain-la-Neuve and at the Sart-Tilman University in Liège. Overseas expansion flourished, in Japan for two world expositions, and elsewhere with important collaborations on projects like Sozacom Tower in Kinshasa with Claude Strebelle, resort works in Ibiza and more recently new projects in Hungary.

The 1980s provided Atelier de Genval with several large scale Brussels projects, with Stéphanie 1 in 1983, a luxury office and retail development in polished stone on the well known Avenue Louise. Its success was confirmed in 1988 with a twin project to form Stéphanie Square. In 1993 the Wiltcher's complex was added, including a luxury 5-star Conrad hotel, apartments and more high class retail and offices forming the largest mixed use complex (75,000 square metres) in uptown Brussels. Investor AG was joined by Herpain for phase three. This triad of projects started a new phase of aesthetic engineering consultancy offered by Atelier de Genval to draw together a coherent aesthetic, as for example with the Brussels Espace Nord, which incorporated different projects and clients with a unifying quality and style.

André Jacqmain : "It is the idea of a unified ensemble of neighbouring buildings that is the basis for any "aesthetical treatment" from Atelier de Genval, in order to avoid monotony and stylistic incoherence in our creation of an architectural ambience. We had to reduce the usual deficiency of such controls in Belgium. Our most recent work was to accompany the European Parliament project (featured in this *Country Report*) with neighbouring architecture for diverse functions, in order to introduce to the ever-changing city of Brussels quite another institutional dimension. Atelier de Genval had a major influence on ensuring an aesthetic direction when the institutional dimension was not yet perceived. The fullness of the project was only discovered when the idea of a new urban space took over the simple act of constructing buildings. The "Parliament concept" and the "Espace Léopold concept" took some time to combine. The out-of-scale measure between the institutional grandeur and the surrounding tissue of primarily individual habitat is often an urban drama which is difficult to accept, such as the one Brussels endured a century ago with the erection of the huge Justice Court. The problem of an urban ensemble is the difficulty of estimating the long term impact made by an architecture of a new dimension and an older urban fabric. There is a confrontation between two visions – between the vernacular and the monumental."

The firm is known for its detailed approach with different areas of expertise ranging from the contextual to the avant garde. Partnership and responsibility is a hallmark which has attracted new working associations. Michael Graves (Princeton, USA) has chosen to work with the Atelier de Genval for the construction of a new Hyatt hotel in Antwerp, while the Conrad Brussels was the product of trans-continental partnership between Atelier de Genval and Graham Design (Woburn, USA) for interiors. Extensive collaborations include the work for the European Parliament and other works with Bureau d'Architecture M Jaspers & Partners (Hasselt), ELD partnership (Antwerp) and Samyn and Partners (Brussels).

Pim Robberechts: "More and more we are confronted in this shrinking world with the possibilities of joint ventures. We have worked side by side with small and large architectural firms, sometimes as the design architect and on other projects as the secondary architect. Through these contacts, we have enhanced our expertise in specific fields. Genval has become a practice with expertise in hotel design and mixed-use projects. We have also become more and more specialised in the renovation of large buildings – often offices. Through this experience we now look at projects abroad and have recently opened branch offices in Luxembourg and Budapest. We also have projects running in the Middle East, Southern Europe and Northern Africa. Personally, I believe an architect must have been a "jack of all trades" at some point, in order to become a specialist. In my early years as an architect I was fortunate enough to work for Michael Graves in Princeton. This was the start of a five-year experience working and travelling in countries such as Morocco, Malaysia or Australia, all of which has helped us enormously. With international ventures the English language is not only a must, but becomes a fact of daily life. Communication is a key factor in any project. **WA**

Building in Belgium and the Netherlands

Belgium

Climate: Cool summers and mild winters.

Population: One of the most densely populated countries in Europe, approximately 97% of the 10 million population live in urban areas.

Language: French, Flemish (Dutch) and German are the official languages. French is spoken by about 41% of the population, Flemish by 58% and German by 1%.

Capital: Brussels

Time Difference: Belgium is 1 hour ahead of Greenwich Mean Time (GMT) and six hours ahead of Eastern Standard Time (EST).

Currency: 1 Belgian Franc (BEF) divided by 100 centimes.

Business Hours:

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

Airport Information: Zaventem Airport is about 12km from Brussels. There is an airport train and bus service to Brussels.

Dialling Code: Belgium's dialling-in code is 32 and the international dialling-out access code from Belgium is 00.

GENERAL CONSTRUCTION INFORMATION

Construction Outlook: The construction industry represents approximately 6% of Belgium's GNP. The total construction turnover in 1995 was 830 billion BEF. The percentage of total value by sector was: 45% residential (40,000 units), 40% non-residential, 15% civil engineering. This level of investment is the same as in 1980. The construction industry, therefore, is in difficulty. Predictions for 1996 are that construction volume will increase by 1.3% overall. However, non-residential activity will increase by 3.5% due to some much-needed state investment in infrastructure works, to bring Belgium back to the same level as its neighbours. The residential sector still remains depressed due to a lowering in disposable income and dissuasive fiscal policies.

Rates of Inflation: Estimated inflation rate for both 1996 and 1997 is 3%.

Procurement/Forms of Contract: Similar to most Western countries. The owner appoints the architect, who then designs the building. The project is tendered and the successful contractor builds the building. For private sector work, selective tendering is most common, although negotiated tendering is also used.

The Ordre des Architectes has a standard form of contract between the client and the architect, which refers to the Norms Deontologique no 2, the architect's code of conduct and fee scale. Contractors, engineers and other construction participants are free to negotiate the type of contract with their client.

Insurance coverage: In addition to the usual insurance's carried by the designers, contractors and owners, there is a requirement for defects insurance to meet the so-called "decennial" requirements of the law. These requirements hold all parties involved to a ten year responsibility for defects and failures rendering the facility unusable for its intended purpose.

As defects arise they are remedied on a no-fault basis. The insurance companies then pinpoint the blame between themselves rather than leaving this to the owner to determine.

Design Professions: The Ordre des Architectes regulates the profession. Architects number about 4,700. By law every new or refurbished construction needs to be drawn, signed and presented to a local authority by an officially registered architect. Generally, architects are regarded by the Belgian public as being "artists" due to their broad based Beaux Arts education, which is not very technically oriented and has given rise to a historical reliance on specialist technicians, engineers and surveyors. The architect is legally responsible for all conceptual aspects and surveillance of his building for a period of ten years from the final handover. Personal insurance is compulsory for architects in Belgium.

Engineers number approximately 14,000 of which 2,700 work in construction. They are represented by a professional body, The Belgian Institute of Engineers.

Contractors: Belgian construction consists of a large number of small firms. La Confédération Nationale de la Construction represents about 855 firms in the industry. The Flemish/Walloon linguistic and political split within the country makes effective competition between Flemish and Walloon construction firms almost impossible outside the "neutral" zone of Brussels. This situation has been exacerbated by the creation of the Brussels Region in 1991.

Contractors are classified on a scale from one to seven in accordance with the size of the construction they can execute. They can tender work in one category above their classification.

The Belgian architect does not specify or detail to the extent of his British or American colleagues and there is an almost total absence of cost control professionals in the process. This leaves the contractor to fill the gap by specifying according to the information he received from the architect before tenders. It also leads to a lessening of the cost control on major projects by the design team.

Governing Codes and Standards: The Belgian Institute for Normalisation (BIN) is a member of the CEN, the European Committee for Normalisation, which co-ordinates European standards. BIN issues the BENOR mark for product approval and maintains data bases for national and foreign standards.

For construction and construction product standards the Ministry of Transport and Infrastructure initiates proposals for new standards and organises subsequent certifications and international agreements. The BUTGB (Belgian Union for Technical Approval) is the agreement body formed by the CSTB (Belgian Building Research Institute) and the technical bureau SECO (Safety of Building in Belgium). BUTGB carries out research and testing prior to the drafting of new regulations and standards.

CONSTRUCTION MATERIALS AND METHODS

Material Availability: An extensive range of innovative and traditional materials are available. Belgium is a European leader in providing the latest construction materials.

Labour Availability: A large and qualified labour force exits. Many craftsmen/artisans are

Economic Data: Belgium

Consumer Price Index: 1990=100

1991	1992	1993	1994	1995(est)
103.1	105.6	108.5	111.1	112.8

Exchange Rates: Belgian Francs per US$

1991	1992	1993	1994	1995	1996
31.27	33.18	36.11	31.84	29.41	30.00

World Architecture *and* Hanscomb *thank Roy International Consultants for assisting with this information. We regret that we were unable to publish information on construction costs in Luxembourg*

still available due to the country's historic ties with quality traditional methods. Labour however is expensive.

Equipment Availability: A very comprehensive range of equipment is readily available.

CONSTRUCTION COST GUIDES

Pricing Manuals: Commercially available pricing manuals do not exist in Belgium.

Regional Cost Variations: Any cost variation depends on local/regional politics, but in general construction costs are the same throughout Belgium.

USEFUL ADDRESSES

Conseil National de l'Order des Architectes
Rue de Livourne 160/2
B-1050 Bruxelles
Belgium. Tel: + (32) 2 647 06 69
Fax: + (32) 2 646 38 18

Association des Entrepreneurs Belges de Travaux de Génie Civil
(Association of Civil Engineering)
Avenue Grand Champ, 148
B-1150 Bruxelles
Belgium. Tel: + (32) 2 711 00 44
Fax: + (32) 2 711 30 93

Belgian International Construction Industry
Avenue Grand Champ, 148
B-1150 Bruxelles
Belgium. Tel: + (32) 2 771 20 84
Fax: + 932) 2 771 00 07

The Netherlands

Climate: The summers are cool and the winters are mild.

Population: Around 90% of the Netherlands population of 15.3 million live in urban areas.

Language: Dutch is the official language.

Capital: Amsterdam is the capital, but the seat of government is the Hague.

Time Difference: As in Belgium.

Currency: 1 Guilder or Florin (Dfl) divides by 100 centimes.

Business Hours:

Government:	8:30-4.30, Monday-Friday
Banks:	9:00-5:00, Monday-Friday
Business (varies)	8:30-6:00, Monday-Friday

Dialling Code: The dialling-in code is 31 and the international dialling-out code is 00.

GENERAL CONSTRUCTION INFORMATION

Construction Outlook: The Netherlands experienced a strong growth in construction during most of the 1980s but declined in the late 80s and early 90s. Construction output for 1996 appears strong. Bidding competition will remain strong throughout 1996.

Rates of Inflation: The estimated 1996 inflation rate for the construction industry is between 2 and 3%.

Procurement/Forms of Contract: Similar to that in Belgium. Typically, design is substantially complete at tenders. While open tendering is used, selective lump sum tendering is most common for private sector projects. Negotiated tendering is also used.

The general contracting approach is used for most construction in the Netherlands. However, alternate methods of contracting are used, such as design-build, construction management, and separate trade contracting. General Contractors will sub-contract speciality trades.

The principal form of construction contract used is the Uniforme Administrative Voorwaarden (UAV). It is a public sector contract, used extensively in the private sector, but there are no regulations requiring its use in the private sector.

Governing Codes and Standards: The privately run Nederlands Normalisatie Institut (NNI) publishes standards for the building industry. There is a national building code which may reference NNI standards.

CONSTRUCTION MATERIALS AND METHODS

Material Availability: A wide variety of quality construction materials are produced in the Netherlands and all common building materials are readily available.

Labour Availability: A large and highly skilled labour force exists.

Equipment Availability: A very comprehensive range of equipment is readily available.

USEFUL ADDRESSES

Bond van Nederlandse Architecten (BNA)
Postbus 19606
1000 GP Amsterdam
The Netherlands. Tel: + (31) 20 555 3666
Fax: + (31) 20 555 3699

Nederlandse Vereniging van Bouwondernemers
Postbus 620
2270 AP Voorburg
The Netherlands. Tel: + (31) 70 386 0204

Economic Data: The Netherlands

Consumer Price Index: 1990=100

1991	1992	1993	1994	1995(est)
103.9	106.4	109.2	112.2	114.1

Exchange Rates: Dutch Guilders per US$

1991	1992	1993	1994	1995	1996
1.71	1.81	1.94	1.74	1.60	1.66

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

	Franc/m2
Warehouse	10,000-12,000
Office Building with AC (Low-Mid rise)	22,000-35,000
Hotel, 5 Star (excl. FF&E) City centre	45,000-60,000
Parking Structure (multi-storey)	12,000-14,000
Mid-rise (10 storey) Apartment	18,000-20,000
Industrial Building	16,000-17,000

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

	Guilders/m2
Warehouse	700-1,200
Office Building with AC (Low-Mid rise)	2,100-2,800
Hotel, 3 Star (excl. FF&E)	2,400-3,000
Parking Structure (multi-storey)	450-700
Mid-rise Apartment	1,250-1,750
Industrial Building	850-1,500

Benelux– Major architectural practices/design firms

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

Architectural practice / design firm	Total architects	Total staff	Total offices	Area of Specialisation: Health care	Industrial	Commercial	Office buildings	Housing / Residential	Planning	Interiors	Sport / Leisure / Recreation	Hotel / Restaurant	Education	Laboratories / Research	Transport	Other
BELGIUM																
Samyn and Partners, sprl Architects and Engineers	35	41	3	•	•	•	•	•	•	•	•	•	•	•	•	
Groep Planning	30	85	1	•	•	•	•	•	•	•	•	•	•	•	•	•
Art & Build	30	36	1		•	•	•	•	•			•	•	•		
Cerau	25	-	3	•	•	•	•		•		•	•	•	•		
Atelier d'Architecture de Genval SA	21	26	2			•	•	•	•	•		•	•			•
Archi + i	18	26	1		•		•	•	•	•						
Atelier D'Art Urbain scrl	17	23	1	•		•	•	•	•		•	•				
Aries Partnership International Inc	16	40	3		•	•	•	•	•	•	•		•			
Bureau D'Architecture Emile Verhaegen SA	16	39	1	•	•		•	•	•	•	•		•	•		•
Les Architectes Polak sprl	15	17	1		•		•	•			•	•	•	•		•
Bureau D'Architecture H Montois	14	21	1	•	•	•	•	•	•	•	•	•	•	•	•	
A.2R.C sa	12	14	1					•	•	•			•			•
Architecture Herve Gilson International, sprl	12	15	3	•	•	•	•	•	•	•	•	•	•	•	•	•
ARC SA	12	15	1				•	•	•			•	•			
Cooparch - R.U. scrl	12	24	2	•			•	•	•		•	•	•		•	•
Bureau Audex	12	18	6	•	•	•	•	•	•	•	•	•	•	•	•	•
B.O.A.	12	15	1		•	•	•	•	•	•	•	•	•	•		
Architektenburo Ryckaerts, Peeters + Partners	11	18	1	•	•	•	•	•				•	•			
Architektenburo Storme Storkebaum van Ranst	10	20	1	•	•	•	•			•	•	•	•	•		
DE Smet & Whalley Architects SA	10	12	1		•		•	•	•	•	•	•		•	•	•
ELD Partnership	10	35	1		•		•			•		•		•		
Atelier d'Architecture Robert et Alexandra Mahieu	9	14	1	•	•		•	•		•	•	•	•			
Office of Architects Jaspers	7	20	2	•	•	•	•					•	•			
Synergy International	7	10	1	•		•		•	•				•			
Bureau Marÿnissen	6	13	3			•	•	•	•		•	•		•		•
Atelier D'Architecture Aldo Sanguinetti sprl	6	6	1		•		•	•		•						•
Atelier D'Architecture Paul Becker sprl	5	6	1		•	•	•	•				•				
Architecture et Urbanisme - A+U	4	15	2			•	•	•					•			
THE NETHERLANDS																
Atelier PRO	12	70	1			•	•	•		•	•		•			•
BDG Architekten	12	140	3	•	•	•	•	•	•	•	•	•	•	•		
Benthem Crouwel Architekten BV bna	12	19	1		•	•	•		•	•	•	•	•	•	•	
Arch. Buro CEPEZED	12	16	1		•	•	•	•			•	•	•	•		
Architectenbureau Van den Broek en Bakema BV	11	45	1	•	•	•	•	•	•	•	•	•	•	•	•	•
Jorissen Simonetti architecten	10	50	1	•		•	•	•			•		•			
Architectenbureau Ellerman, Lucan, Van Vugt	9	35	1			•	•	•	•	•						
OD 205 Architectur BV	9	47	3	•	•	•	•	•	•	•			•	•	•	•
Bouwontwerpgroep Kokon BV	9	35	3		•	•	•	•	•	•	•	•		•	•	
Aukett + Kokon	8	14	4		•	•	•	•				•		•		•
Groosman Partners BV	8	55	1	•		•	•	•	•	•		•	•	•		•
Architektenburo Roeleveld-Sikkes BV	8	25	1			•	•	•			•	•				
Archtectenbureau De Twee Snoeken	7	36	1	•		•		•					•	•		•
Architectenassociatie Aa	6	25	1	•		•	•	•		•	•		•	•		
Architektenburo Coppen BV	6	18	2					•	•				•			•
SVT Creative Consultants	6	22	1			•				•		•				•
Architektenburo Visser en Beerman BV	6	45	1			•	•	•	•				•	•	•	•
Bouwburo Byenkorf	5	16	1			•				•		•				
Van Der Breggen Architekt BV	5	13	1				•	•				•				
LIAG architekten en bouwadviseurs	5	27	1			•			•	•		•	•	•		•
BDC Ing. en Architecten	5	20	1	•	•	•	•	•					•		•	•
Post Ter Avest Architecten	5	25	2	•			•	•			•	•				

Benelux – Major architectural practices/design firms

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

Architectural practice / design firm	Total architects	Total staff	Total offices	Area of Specialisation	Health care	Industrial	Commercial	Office buildings	Housing / Residential	Planning	Interiors	Sport / Leisure / Recreation	Hotel / Restaurant	Education	Laboratories / Research	Transport	Other
OKRA	5	7	1														•
Derks Stedebouw BV	5	12	1				•	•	•	•		•				•	
Hubert-Jan Henket bna	4	8	1		•												•
Architectenburo CKPP	4	11	1		•			•	•								
Teeken en Beelen Architekten bna	4	10	1				•	•	•		•						
KAS Oosterhuis Architekten	4	5	1					•	•	•							•
Hoogstad Architecten	4	25	1					•	•	•				•			
CH & Partners	4	5	1				•	•	•	•							•
Architektenbureau Trema BV	4	16	1				•	•	•			•					
Tekton Architekten	4	8	1					•	•			•	•				
Bakker Boots Van Haren Dijkhof	4	57	2		•	•	•	•	•						•		
Hidde Consultants	4	6	3		•			•		•	•		•				
Gunnar Daan Architektuur BV	4	10	1					•	•	•	•	•		•			•
Architeckturburo irs. Vegter b.i.	4	16	1			•		•			•	•		•		•	•
Molenaar & van Winden	4	8	1		•			•	•								•
Walraad & Yd Stoep	3	5	1			•							•			•	•
BV Arch. Geluk & Treurniet	3	10	1		•				•								
Area Architekten bna	3	5	1			•	•	•	•		•		•			•	
Architektenburo VORMER	3	12	1		•	•	•	•	•	•	•	•	•	•			
Architectenbureau Wilmink	3	9	1				•	•	•		•		•				
SEB Architectenassociatie	3	6	1		•			•	•		•						
Architektengroep Kok Straatman de Hann BV	3	9	1		•			•	•					•			
Karel Nieuwland Architekten BV	3	12	1		•	•	•	•	•	•	•			•	•	•	
Butzelaar, Architecten	3	-	1				•	•	•	•	•						
Architectenbureau Korbee	3	12	1				•	•	•			•	•	•		•	
Lensink Albers architekten bna	3	10	1				•	•	•								•
Arch.Buro Gendt / Mühlstaff en Zondag BV	3	12	1		•				•								
SILO	3	3	1						•		•		•				•
Van Leeuwen Architecten bna	2	8	1		•	•	•	•	•								•
Van Ringen Architecten	2	8	1				•	•	•								
Van Tilburg en Partners	2	15	1				•	•	•						•		•
Architektenburo Hartman en Eylers BV	2	10	1			•	•	•	•			•					
Architektenburo Van Overbeek & Partners BV	2	10	1		•		•	•						•			•
Luijten Architectuur en Stedeboew BV	2	5	1			•		•	•	•							
Architektenburo Scheffer	2	6	1					•	•								
MAAT Architecten BNA	2	7	1				•	•	•	•							
H.W. Van Der Laan BV	2	12	1			•	•	•	•	•		•				•	•
Architektenburo Van Duwerkerk Geesink bna	2	10	1		•		•	•						•			•
Buro Dansen De Moer	2	8	1			•	•	•	•			•	•			•	
Platell - architektuur	2	8	2			•	•	•	•			•	•			•	•
LUXEMBOURG																	
Hermann & Valentiny Architectes	14	27	1				•	•	•	•	•	•	•	•			
Architecture et Environnement SA	12	28	1		•		•	•	•			•	•	•			
Christian Bauer Architectes	10	14	1					•	•	•	•		•	•			
Atelier D'Architecture Paczowski & Fritsch	8	12	1		•			•	•	•	•					•	
AAU 21	8	12	1		•	•	•	•	•	•	•	•	•	•			
Ballini & Pitt Architects	6	20	1					•	•		•						
Romain Hoffmann	6	10	1		•			•	•	•	•	•		•			
Jean Petit Architectes	5	10	1					•	•		•		•	•			
Stanislaw Berbec	4	6	1				•	•	•	•	•			•			
Claude Schmitz Architecte Dipl. EPFZ	4	9	1			•			•					•			

Brixton Estate Brussels Plc, Business Park

Nestlé Belgilux s.a. Bruxelles, Registered office

Résidences Puccini & Verdi, housing development - Brussels

Bureau d'Architecture et d'Ingénierie

ARCHI+

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Fax: + 32 (2) 640.53.55

Other Offices
ARCHI + I are in partnership with architectural practices in Amsterdam, Berlin, Hamburg, London, Madrid, Milan and Paris.

Key Personnel
Principal: Philémon Wachtelaer

Management Team:
Raoul Thomas
Nathalie Lodewijckx

Size of Practice
25 employees

Recent clients
Adac
BMW
Brixton Estate plc
Cofinimmo
Compagnie Immobiliere de Belgique
Chrysler I.C.
Deutsche Industrie und Handelskamer
Fiat Engineering
Freistaat Bayern
German Embassy
GIB Group
Goethe Institut
Hamburgische Landesbank
HKM
I.D.I.M
Investimmo
KFW
Nestlé
Novo Nordisk
Mercedes Benz Belgium
Ministry of the Brussels Region
Ministry of Communications
Red Cross of Belgium
Senat Berlin
S.D.R.B

Practice Profile
ARCHI + I was created in 1984 with the aim of merging imagination and creativity, the essential elements of architecture, with a more global approach to take into consideration town planning, technical and economic constraints.

Compliance with the economic constraints, scheduling and performance criteria, defined by the owner, are determining factors underlying our architectural work. We use imagination, creativity, awareness, technical skills and experience to achieve our objectives: architectural quality, identifying the project in terms of the owner's philosophy and optimising our response to the criteria provided. The organisational structure of ARCHI + I, founded on an integration of diverse activities each with their specific and complemnetary skills, provides an overall solution to the complexities of real estate investment, acting as the owner's sole interlocutor. ARCHI + I thereby assumes an integrated responsibility, from the beginning of the feasibility analysis to the final reception of completed work.

Areas of specialisation
ARCHI + I has considerable experience in successful projects in a wide range of fields covering town planning, office, industrial and residential buildings. Its subsidiary TILLYARD BELGIUM has specialist skills in quantity surveying and project management.

Additional information
ARCHI + I works with multilingual collaborators which means that we can carry out projects in English, French, Dutch, German, Italian, Spanish.

North Tower, Brussels

Michael Ostlund Property, Brussels

Brother International Headquarters Benelux, Belgium

ARIES PARTNERSHIP International INC.

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FRANCE

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L.1145 LUXEMBOURG

Key Personnel
Principal: Luc-Georges Dubrulle
Management Team:
Edwin Renders
Sebastian Moreno-Vacca
Raphaël Pollet

Size of Firm
30 employees

Recent Clients
A.S.L.K.-C.G.E.R.Bank
AN-HYP Bank
BELGIAN RAILWAYS
B.R.T. Television
BROTHER International
Brussels Institue for Environmental Affairs
City of Charleroi
City of Brussels
City of Ghent
COCA-COLA Belgium
EUROPEAN COMMUNITY
EUROBALKEN
FOLKSAM Property Holding
FORD MOTOR Cy
JONES LANG WOOTTON
MICHAEL OSTLUND Property
Ministry of Brussels Region
Ministry of Public Works
Ministry of Education
MAZAK - NISSHO IWAI
NO-TELE Television
NOVA SIENNA - Warsaw
Peek en Cloppenburg
PEUGEOT
PHILIPS pensionfund
RODAMCO
SABENA World Airlines
SLOUGH ESTATES
SUBARU Belgium
SUN ALLIANCE Insurance
TASIBEL Carpet factory
THYWISSEN-Malz
TIENSE SUIKERFABRIEK
V.T.M. television
Vlaams Woningfonds
V.M.A Industry

Practice Profile
The practice was founded in 1974 as a Limited Cy by architect Luc-Georges Dubrulle, following a series of first prize awards in open Belgian competitions. In 1984 it was transformed into ARIES-architects INC and in 1994 became ARIES PARTNERSHIP International, due to commisions awarded in Luxembourg and Poland.

The company, in joint ventures with Dutch consulting engineers, created two subsidiary firms: ARIES engineering, in 1986 with Nagtglas Versteeg (A-dam) and ARIES environment, in 1990 with HASKONING (Nijmegen), which has been known as ARIES engineering & environment INC since 1994.

This company is today one of 12 consulting firms officially recognised by the Brussels Regional Government as expertly trained for Environmental Impact Studies.

Size of the firm
A.P.I relies on an experienced and dedicated team of over 30 planners, architects, interior and landscpae designers, civil engineers (structural and ME & EE), environmental engineers, technicians, - fully supported by an extensive administrative staff and the management of the partners.

The entire Belgian staff is fluently Dutch, French and English speaking, many master a fourth or fifth European language.

Specialisation
In 1988 A.P.I established a special unit for CAD and from 1990 CAD has been employed in the design of all major projects. Besides experience in the design of schools, sports centres, housing projects, industrial and office buildings, where as well as architecture, special attention is given to technical equipment following the latest technologies.

A.P.I. also specialises in project management, space planning and environmental affairs.

The international joint venture structure enables A.P.I. to tackle the largest possible projects at any given time, and recruit special "task forces" from over 700 specialists.

"Oranjerie" Shopping centre in Apeldoorn

Apartment blocks in Leidschendam

Extension to the Court of Justice in The Hague

ING and Stibbe Twin Towers in Amsterdam

Architectenbureau | Ellerman | Lucas | van Vugt

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Fax: +31 (0) 70-3998062

Directors
ir. Wout Ellerman, ir. Jann Bart Lucas
ir. Niek van Vugt

Staff
ir. Jaap Piso, ir. Rugier Timmer, ir. Ab Veerbeek, ir. Paul van Veggel, ir. Frits van Zutphen, mrs. Ninky Oyevaar, Charles Hulleman, Fred Haasnoot, ir. Rob Vrouwes, Rob Merks.

Major clients and projects

Amstelland Vastgoed
- Office building, apartments and shops in Almere-Buiten
- "Cascade" Office building in Groningen

Burgholding
- Renovation of shopping centre "Gelderlandplein" in Amsterdam
- IBM Office building for IBM and Interpay in Utrecht

MAB
- "Babylon" Office building, shopping centre and cinema in The Hague
- "La Vie" Office building, shopping centre and department store in Utrecht
- "Zaailand" shopping centre and apartments in Leeuwarden
- "Nieuwe Passage" Shopping centre in Schiedam
- Department store in Almere
- Office building and parking facility in Amstelveen

MBO (ING Real Estate)
- Renovation and extension of "Atrium" Office building in Amsterdam
- ING and Stibbe Twin Towers Office buildings in Amsterdam
- "Oranjerie" shopping centre and apartments in Apeldoorn
- Shopping centre and apartments for Osdorpplein in Amsterdam

Hoogovens Pensioenfonds
- "Toolenburg" shopping centre, apartments, library and health-centre in Hoofddorp

City Council of Arnhem:
- Masterplan for railway station quarter

City Council of Amstelveen
- Masterplan for Town Centre

KPN (Netherlands Royal Post)
- Office building in Leeuwarden

Multi Vastgoed
- "Plaza" Offices, shopping centre, apartment block and casino in Rotterdam
- Extension to the Court of Justice in The Hague

Nationale Nederlanden
- Office buiding for Assurance Company "Tiel-Utrecht" in Utrecht

The State Department (R.G.D)
- Renovation of the Court of Justice in The Hague

Vastcon/Schouten
- Apartment blocks in Leidschendam

William Properties
- Office building and apartment block in The Hague

Nemeog
- Masterplan for Utrecht-centre in Utrecht

Awards
- "La Vie" in Utrecht and "Zaailand" in Leeuwarden received a prize from the International Organisation for Shopping Centres, the ICSC-Europe.
- "Toolenburg" in Hoofddorp received a prize from the National Organisation for Shopping Centres the NRW.
- "Atrium" Office building in Amsterdam the Property Development prize
- "Oranjerie" Shopping centre in Apeldoorn has been nominated in 1996 for a prize from the ICSC-Europe.

Profile
Achitectenbureau Ellerman, Lucas, van Vugt was established approximately 50 years ago and has extensive experience in professional services, including; architecture, masterplanning, renovations and interior design.
Important considerations during the design and building process are ; respect for the needs of the client, urban context and budget-constraints.
The office seeks to create designs of a high standard, and unique buildings.

Brussels International Airport

Service Flats

Citibank

Psychiatric Hospital

Sun Park

Above and opposite page – Indosuez Bank

The Peter Van Kerckhove Partnership

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Fax: 32 2 647 99 93

N.V. Technisch Studiebureau STUDIUM
2A Zevenbergenlaan
8200 Bruges - Belgium
Tel: 32 50 39 05 53
Fax: 32 50 39 05 06

Total architects: 89

Total Offices: 4

Areas of specialisation:

Healthcare
Industrial
Commercial
Office Buildings
Housing/Residential
Religious/Cultural
Planning
Interiors
Sport/Leisure/Recreation
Hotel/Restuarant
Education
Laboratories/Research
Teamsport
Other

Practice profile

The partnership is led by Peter van Kerckhove assisted by a group of senior architects and engineers. Each service is actively involved in the overall design control of all projects. Every individual project is handled by a team of carefully chosen professionals under the leadership of a project architect.

We offer a highly personalised service, believing that close collaboration with the client, during all phases of development, is a crucial component in the design of successful architecture.

Since successful architecture must respond to the internal forces of the building programme as well as the external forces of its context, the partnership does not design buildings according to the dictates of a particular house style. We believe that every building should have its own identity created by a simple and expressive architecture corresponding to its specific functions and location.

With five decades of experience, the partnership works in a spirit of total independence from all commercial and industrial interests. Thanks to a long lasting relationship with our clients Montois, Van Kerckhove and Studium are charting an exciting future that transcends international boundaries and expands the horizons of quality design.

Additional information

The Peter Van Kerckhove Partnership believes that architecture, landscaping, interior design and engineering – both of the structures and the building service – are indivisible in order to achieve the high quality standards applicable in the practice. This is why the partnership is capable of handling the full range of these design requirements in house.

Areas of specialisation

Having been in business for almost 50 years Montois, Van Kerckhove and Studium has been commissioned for an extremely wide range of building types ranging from medical social services to recreational, educational, residential and commercial buildings.

The partnership also has experience in community buildings as well as in a wide variety of industrial facilities.

Recent clients

Belgian Airport Terminal Company, Indosuez Bank, Bernheim Outremer, A,G. 1842 Insurance Company, Confinimmio, The Luxembourg Ministry of Foreign Trade, Sun Parks International, Religious Congregation of the Brothers of Charity, University of Louvain, Belgian Ministry for Public Works.

Experience in the following countries

Belgium, Netherlands, Luxembourg, France, Germany, United Kingdom, Spain, Portugal, Zaire, Rep. Pop. du Congo, Cameroon, Nigeria, Senegal, Madagascar, Burundi, Liberia, Kuwait, Egypt, Saudi Arabia, Libya, Iraq.

Projects

Just and honourable

Paczowski & Fritsch's extensive additions to the European Court of Justice in Luxembourg are designed with the gravitas befitting its function. The challenge of realising its fulcral position "in stone" has emerged in a classical "chateau-like" form. Some elements of the building have been designed to reflect their specific role while others incorporate paradoxes (such as plant rooms in the chateau towers) that are reminiscent of post-modernism. Overall the lasting impression is one of a confidence-inspiring design reflecting transparency and institutional decorum.
Text: Peter Wislocki.

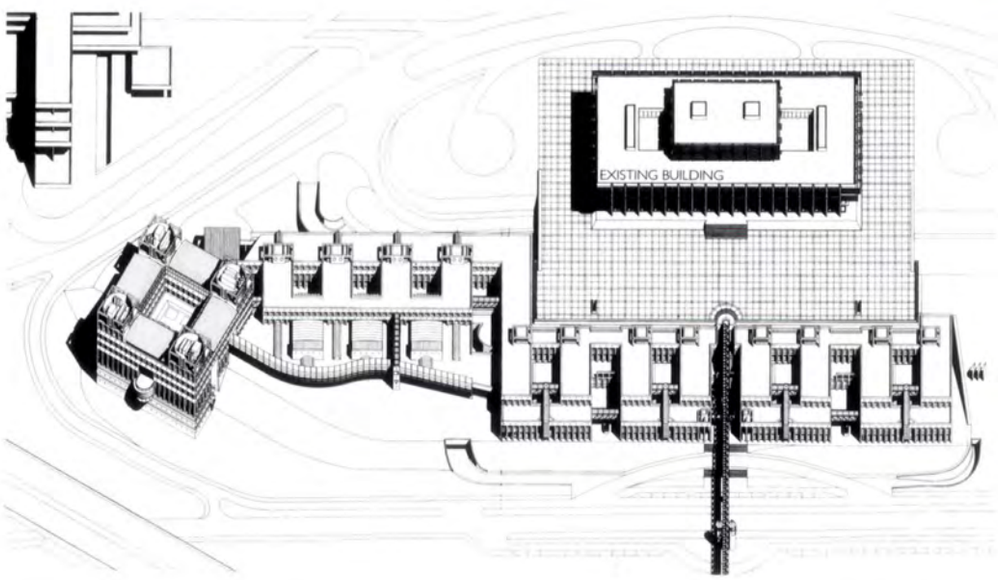
One of the European Union's main administrative hubs, the popular image of Luxembourg derives from the presence of 114 foreign banks, and – in architectural circles – the Krier brothers, Leon and Robert. The Grand Duchy is a serious-minded place, culturally, economically and architecturally. Just to the north-east of the centre of Luxembourg City, across the dramatic canyon of the Alzette, the Kirchberg Plateau has become the home of a number of European institutions, lately joined by foreign financial sector businesses. The international organisations are tenants of the Grand Duchy, whose Ministry of Public Works commissioned all of the plateau's seats of pan-European bodies.

Near the centre of the plateau, the original building of the European Community Courts of Justice, designed by Conzemius, Jamagne and Van der Elst, is an elegant Korten-clad pavilion, biaxially symmetrical, rhythmically-colonnaded monument, perched on an expansive podium. Within a few years of its completion in 1972, the Palais had to be enlarged, its intrinsic purity presenting an architectural dilemma. The concept for extending the courts was established in 1980, the project being executed in three phases. The coherence of the original building is preserved by following its orthogonal geometry (and, initially, its axial symmetry) and situating new structures lower down the slope from the Courts to the adjoining rue du Fort Niedergrünewald.

The first extension, completed in 1988, added 350 cellular offices, a restaurant, two small (80 seat) court rooms, a print shop, bank branch and parking. Linked to the Palais only by a 50 metre long tunnel, carved through the Kirchberg rock, the height of Paczowski and Fritsch's building is restricted to the level of the earlier block's podium, respecting its place on the plateau's skyline. Clad in French "Rose de la clarté" granite, whose warmth harmonises with the rusty hues of the 1972 pavilion, the scale of the extension is defined by its tapestry of intimate courtyards, glazed passarelles and steel bridges.

The next phase of the project, designed in 1987 and completed in 1992, extends the "rampart" westwards. Two hundred and thirty further offices, two court rooms, a meeting room, cafeteria and a restaurant are accessed through a linear foyer, whose undulating glazed facade – south-facing, and therefore provided with solar shading – provides the dominant architectural motif. Exposed steelwork, here as throughout Paczowski and Fritsch's building, is painted in green-grey and yellow, colours chosen to complement the granite of the exterior and the Korten Palais. The northern facade, by contrast, is austere and authoritarian – an enormously long, unrelieved rhythm of red granite columns.

The third, and for the time being final, phase of the Courts of Justice, recently completed, accommodates the main, 400 square metre court room, used for preliminary hearings, with 220 associated offices and ancillary facilities. The cubic mass of the latest phase is skewed from the primary grid, fitting neatly into the confined corner of the site, and establishing the massive structure as second only to the original Palais – over 100 metre distant – within the ensemble. Described by



Main image above *Roadside elevation of the extension to the European Courts of Justice by Paczowski & Fritsch.* ***Inset from left to right*** *The foyer "wave". South entrance. Foyer "wave" viewed from above.* ***Right*** *Site plan*

Below *Ground floor plan; south elevation; north elevation.* ***Opposite page left, top and bottom*** *The glass canopy of the north entrance to the Court of the First Instance,* ***right****. Exposed steel work throughout the building is painted in green-grey and yellow to complement the granite of the exterior and the Korten Palais.* ***Bottom*** *Plans of all floors of the European Court of Justice*

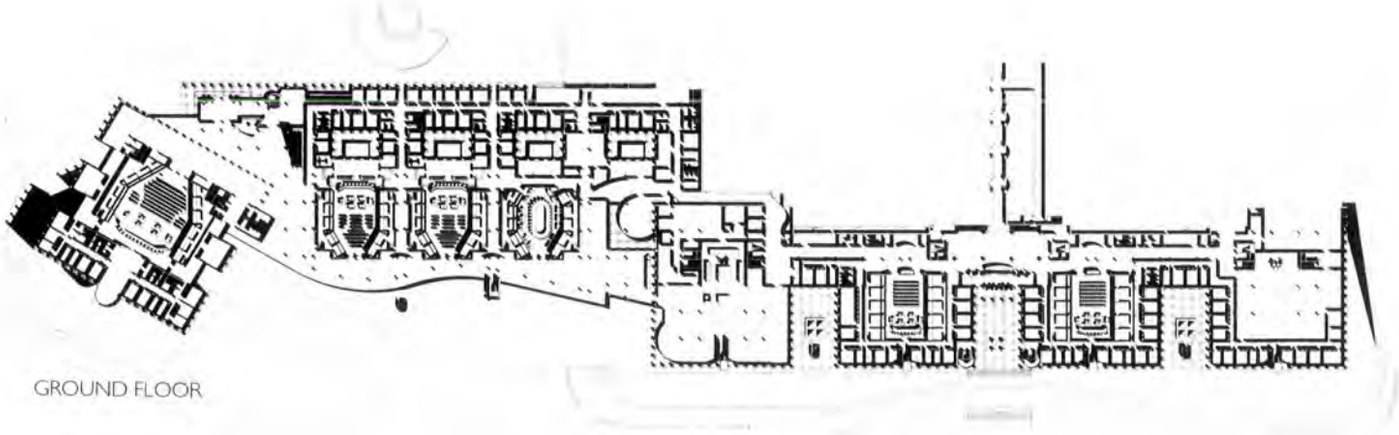
the architects as "chateau"-like, with its elevated, metal-clad corner towers (actually containing plant rooms), the final phase is more formal and compositionally autonomous than the earlier extensions, its biaxial symmetry focused on an elevated central courtyard, surmounting the main courtroom.

The organisation of the phased extensions, together adding over 64,000 square metres to the court complex, is clear and rational. The architects' frontal axonometric drawing represents the scheme at its strongest: single-minded, elegant and clearly part of a 1980s European tradition of classically-inspired architecture, with echoes of Ungers, Rossi, Stirling and other leading designers of the last decade. To acknowledge that the design is a little dated (having had a lengthy period of gestation) is not, in itself, to detract from its propriety.

The typology of the building – linear sequences of courtrooms and meeting places, surmounted by rhythmic rows of courtyards – is good for orientation and ease of circulation. The repetitive facades are restrained, and do no more than express the equally mundane administrative functions within. The legible hierarchy of the whole gives appropriate precedence to key elements: the deliberation suite, for example, is articulated by a semicircular bay window.

The extensions' public foyer spaces continue the aesthetic of the exterior, with highly polished granite floors. The main courtroom of the latest phase, having to accommodate a panel of 15 judges before dozens of advocates, is provided with the requisite 15 simultaneous-translation booths. Buried deep within the building, and denied natural light, the court room's most memorable quality is the complexity of its ceiling, composed of fracturing planes, suspended at irregular angles. This aside, much of the building's interior is predictably corporate in character – not unlike Luxembourg's numerous banks, but constructed to a significantly lower budget.

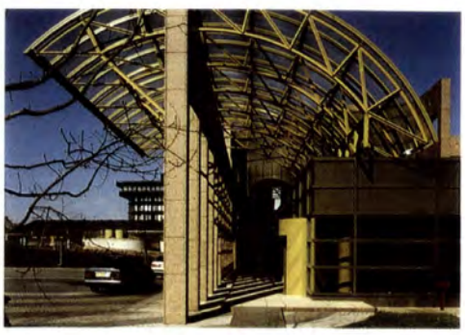
Bohdan Paczowski and Paul Fritsch,

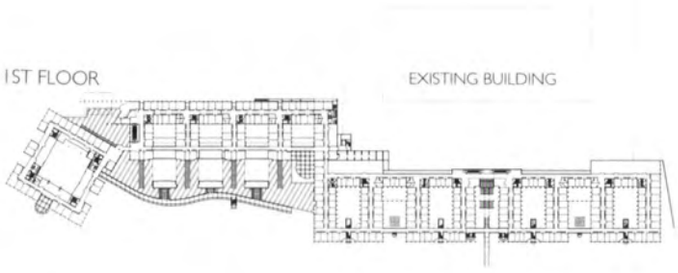


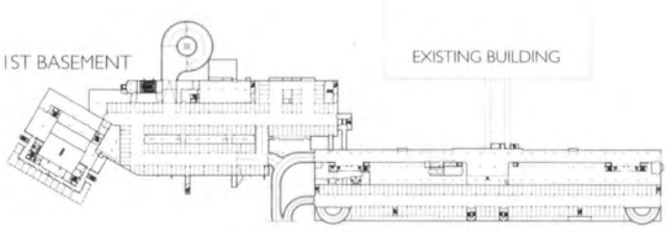
GROUND FLOOR

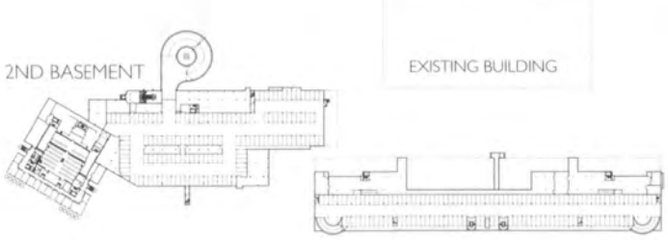
SOUTH ELEVATION

NORTH ELEVATION

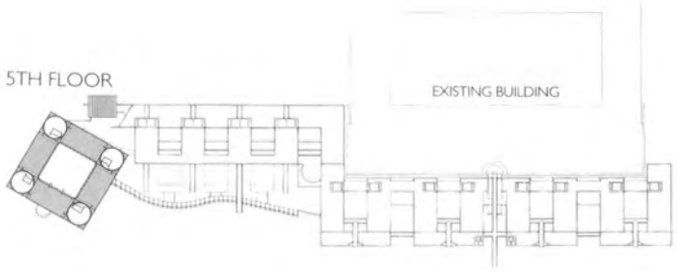


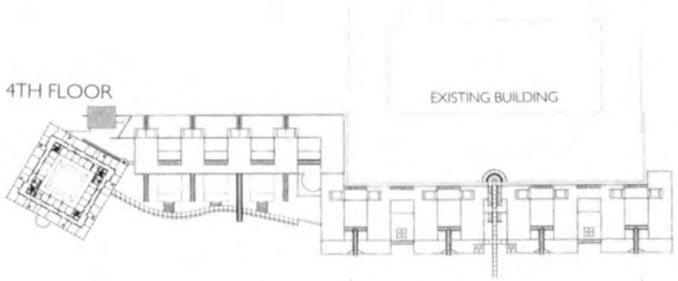

1ST FLOOR
EXISTING BUILDING


1ST BASEMENT
EXISTING BUILDING


2ND BASEMENT
EXISTING BUILDING


3RD BASEMENT
EXISTING BUILDING


5TH FLOOR
EXISTING BUILDING


4TH FLOOR
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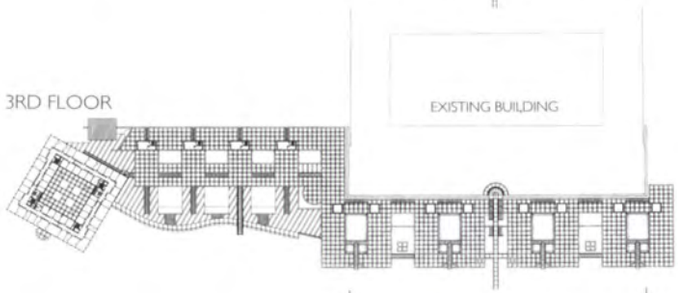
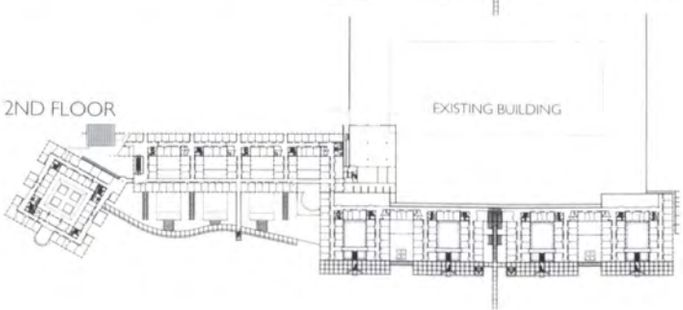
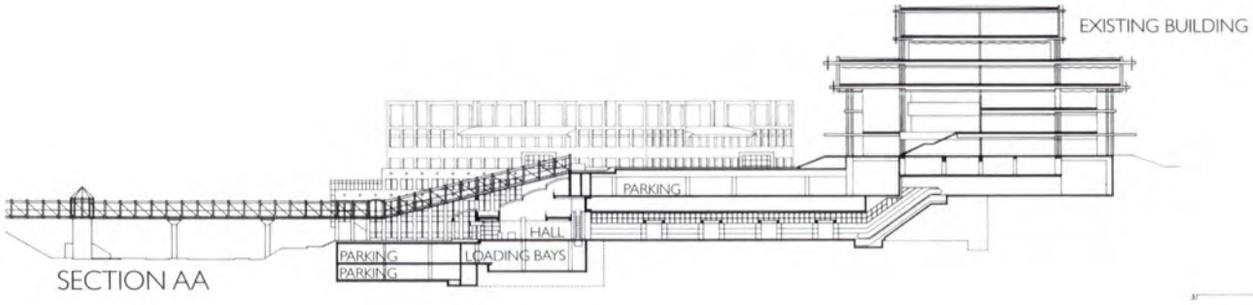
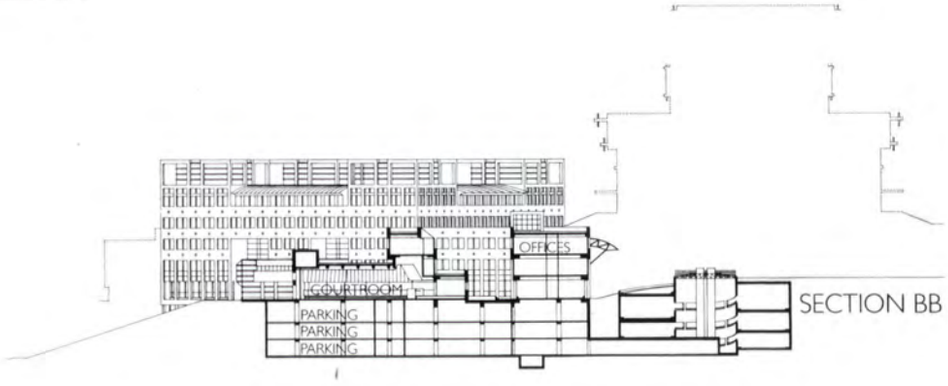

3RD FLOOR
EXISTING BUILDING

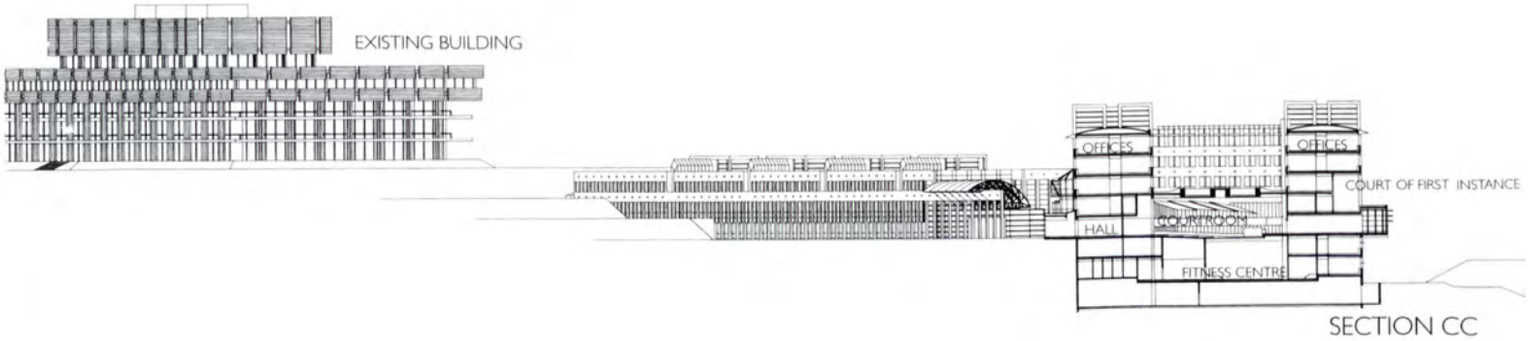

2ND FLOOR
EXISTING BUILDING



SECTION AA



SECTION BB



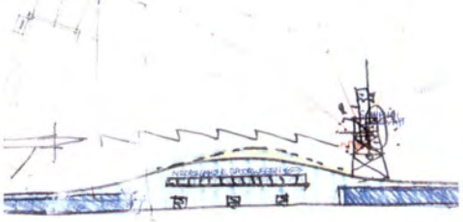
SECTION CC

Opposite page left and below right *Interior view of the main courtroom.* ***Opposite page top right*** *Entrance to the courtroom.* ***Opposite page bottom*** *Section through the existing building and new extension, showing the "steps" scheme.* ***This page*** *Interior view of the foyer*

architects of the three successive extensions of the complex, have established a reputation as one of Luxembourg's few internationally recognised designers. Their national pavilion for Seville Expo 1992 has sadly been dismantled; but a number of projects currently under way, including Luxembourg's international airport terminal, build on the firm's experience in designing aesthetically clean, modern, structurally efficient steel and glass buildings. The European Courts of Justice eschew the explicit transparency and populism of Sir Richard Rogers' Court of Human Rights in Strasbourg, reinforcing a more conservative view of institutional decorum. It is not that Paczowski and Fritsch are incapable of applying a lighter touch – their portfolio of buildings and projects proves otherwise.

Of course there are programmatic differences between the buildings: the parties seeking justice in Strasbourg being mostly individuals, whereas the Luxembourg courts adjudicate between legislators on matters of constitutional, rather than personal, significance. As such, Paczowski and Fritsch have succeeded in giving the building a gravitas befitting its function. The Courts of Justice look like a public institution, not a commercial office complex. In this sense it is more successful than the more anonymous style of the European Parliament assembly building in Brussels, also featured in this issue. **WA**

Project	European Courts of Justice extension
Client	Grand Duchy, Ministry of Public Works
Architect	Atelier d'Architecture Bohdan Paczowski & Paul Fritsch
Associate Architects	Jean Herr, Gilbert Huysberechts, Isabelle Van Driessche
General Contractor	HT Lux (Hochtief-Luxembourg)
Consultants:	
Structure	Schroeder & Associe – Gehl & Jacoby
Fluids	Goblet & Lavandier
Electrical Engineering	Felgen & Associes
Facade Consulting	Facade Consulting, Eindhoven
Acoustics	Ita Gmbh
Planning	Luxconsult SA
Signalling	Interpub



Flying Dutchmen

Schiphol is one of the world's great airports, competing with London's Heathrow, Paris Charles de Gaulle and Frankfurt for intercontinental and European transfer traffic. Located just a few kilometres south of Amsterdam, the 30-year old airport is linked to the rail and motorway networks, putting it well within an hour's travelling time for the majority of the Dutch population. Beside Schiphol, only Rotterdam and Maastricht offer international connections – with far fewer services. *World Architecture* surveys the Schiphol Plaza at Amsterdam International Airport by Benthem Crouwel. Text: Peter Wislocki

Like most airports, Schiphol has grown incrementally, with separate developments of a second terminal building (also by Benthem Crouwel), an underground railway station, a hotel, car parks and administrative offices. Further facilities are being added, including Benthem Crouwel's World Trade Centre office complex, due for completion later this year. Schiphol's success is measurable not only in terms of passenger numbers – the fourth highest in Europe – but also by the demand for office space on the site, attracting rents 50 percent higher than anywhere else in the Netherlands. The inevitable result of this physical and economic growth has been the lengthening of distances from entrances to boarding gates, with diminished clarity of circulation and potential disorientation of anxious or late-running passengers.

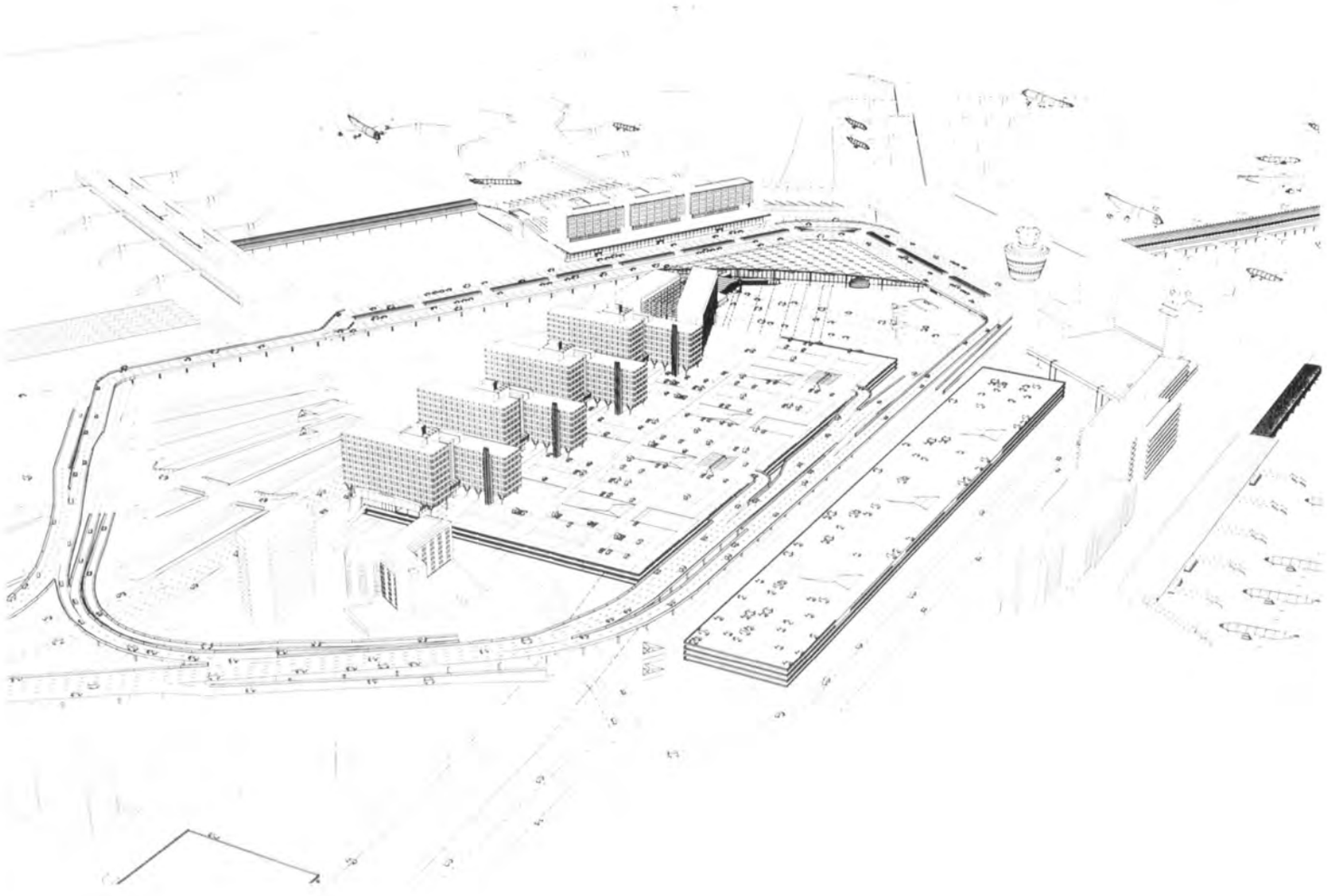
Opposite page top *Schiphol Plaza design sketch, 1992.* ***Bottom*** *View of Schiphol Plaza from transport interchange, a focal point for passengers arriving at, or departing from, the airport.* ***Right*** *Extended view of the plaza* ***and below right*** *Benthem Crouwel's car parks demonstrate the intention to keep new buildings as low as possible, allowing pre-existing buildings to be seen from some distance, as an aid to orientation.* ***Bottom*** *Aerial plan of Amsterdam International Airport showing Schiphol Plaza wedged in between the two passenger terminals*

Jannes Linders

The Amsterdam-based practice was first employed by the airport authority (a company 75 percent-owned by the Dutch government, with shares of 23 percent and two percent held by the respective city authorities of Amsterdam and Rotterdam) in 1982, when they were commissioned to design a bicycle shelter. Since then their projects have grown in size and complexity, Benthem Crouwel having formed a joint venture with the airport's in-house design team, NACO.

Schiphol Plaza, officially opened in June 1995, reintegrates and reorientates the landside part of the complex. Wedged in between the two passenger terminals, the triangular plaza integrates the railway station with direct access from the multi-storey car park, thus bringing together the majority of passengers under one roof. The plaza gives direct access to the arrivals levels of both terminals. Thus arriving passengers are inevitably guided towards the transport interchange, where they may choose to continue their journeys by rail, taxi (from a rank immediately outside) or by private car. Departing passengers reaching Schiphol by train, or having parked their cars, also pass through the plaza, from which they ascend, by means of stairs, lifts or escalators, to the departure level of either terminal. Only those being dropped off by car or taxi now enter the terminal buildings, bypassing the plaza, directly from elevated roadways. Externally, Benthem Crouwel's plaza and car parks have been kept as low as possible, allowing the pre-existing terminal buildings to be seen from some distance, as an aid to orientation.

Schiphol's location in the proposed extension of the European high speed rail network



Below left *The Plaza has been designed as a hi-tech hypostyle hall with a forest of columns distributing the weight of the gently vaulted roof.* ***Below right top*** *View of the Plaza illustrating Benthem Crouwel's expressive use of glass and steel.* ***Below right bottom*** *Interior view demonstrating the openess and transparency of the hall*

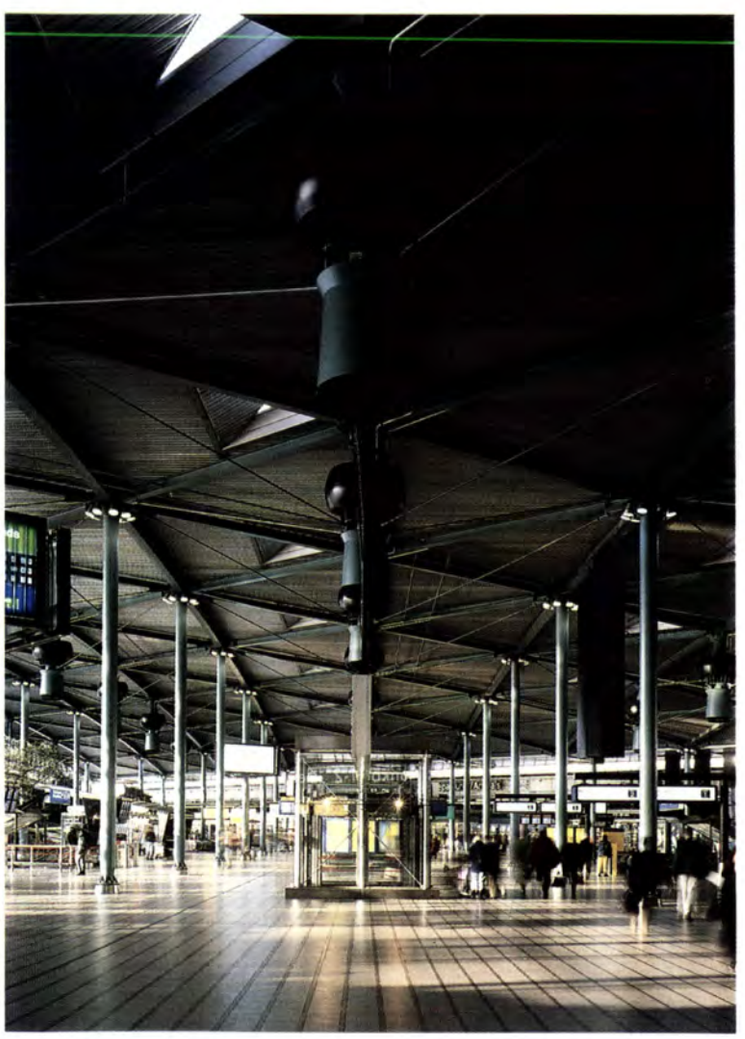
has been anticipated, with the expansion of the underground station. The number of platforms has been increased from three to six (two of which are not presently used, being allocated for future TGV traffic); and the length of all platforms has been increased from 250 metres to 400 metres. Regrettably, there was no opportunity for Benthem Crouwel to bring daylight into the 20-year old, rather dreary platforms, other than through the new access ramps from the plaza. The station has been repainted; but the Dutch rail authorities have not sanctioned any improvement in the levels of artificial lighting, wishing to restrict energy use.

The plaza's location and function make it an obvious focus for the airport's retail and leisure facilities. Two rows of shop units (about 40 in total number) have been installed underneath the pre-existing road flyovers, flanking the perpetually busy 22,000 square metre central triangular volume. A further, more intimately scaled structure containing a restaurant, penetrates the plaza's glass facade. In summer months, the outdoor square in front of the plaza is much used for casual eating and relaxation, being south-facing and largely sheltered from air traffic noise and wind. Throughout the year, whilst aircraft movements are suspended from midnight until early morning, the airport remains open to the public. Schiphol's 24-hour fast food outlets attract city dwellers in the early hours, long after Amsterdam's restaurants have closed.

Tempered technology

Benthem Crouwel, in their expressive use of steel and glass, fall within a distinguishable group of Dutch designers, alongside practices like CEPEZED and Hubert-Jan Henket. Jan Benthem emphasises, however, that unlike some of their compatriots, he is only prepared to use established materials and construction details, in the context of traditional building procurement routes. Benthem's office is primarily concerned with architecture's cultural, social and functional aspects, using only appropriate, if sophisticated, technology.

At Schiphol, Benthem Crouwel were constrained by the loading capacity of the railway tunnels, making long spans (and hence high point loads) impossible. As a consequence, the



Jannes Linders

Jannes Linders

Jannes Linders

Below *In summer months the outdoor square in front of the plaza is much used for casual eating and relaxation, being south-facing and sheltered from air traffic noise and wind*

plaza has been designed as a hi-tech hypostyle hall, with a forest of columns distributing the weight of the gently vaulted roof. The slender columns, and the absence of cross-bracing, maintain the interior's visual clarity – one of the project's key objectives. Triangular, wedge-shaped rooflights mitigate the depth of the plan, allowing glimpses of the sky. The entire roof is detached from the concrete roadway structures, giving a continuous clerestory around the plaza's edge. Only months after installation, signs (not designed by the architects) are being removed or repositioned, to increase the openness and transparency of the hall.

The presence of the railway station also ruled out the use of a servicing undercroft. Specially developed fans, suspended from the roof structure, freshen and recirculate the hot air rising from the busy hall. The roof is covered with moss: a huge patch of vegetation, red in summer and green in winter, amidst a sea of concrete and tarmac, representing Holland's ecological aspirations. The moss covering has practical advantages, offering good thermal and acoustic insulation. Rainwater is collected and channelled down the outer structural columns.

Schiphol Plaza is a disciplined building, which avoids futuristic technological gestures, contrived representations of air travel, or the false comforts of sentimental domesticity. Benthem Crouwel's design is flexible and robust, and even in the rapidly evolving world of international transport, should serve its purpose well into the next century. **WA**

Project	Schiphol Plaza
Client	Amsterdam International Airport
Architect	Benthem Crouwel NACO
Interior Architect	Kho Liang Ie Associates
Construction:	
Engineering	De Weger International
Installations:	
Engineering	Ketel Deerns Raadgevende
Acoustics	Adviesburo Peutz & Associes
Signposting	Buro Mijkeenaar
Planning and logistics	Kombinatie Luchthaven
Main contractor	Kombinatie Luchthaven
Installations	GTI Schiphol 2000

Faceless federalism

Tradition demands that seats of power be anonymous, superficial, undemanding on the eye of both the spectator and the user. The recently completed European Parliament, in Brussels represents at least a partial break with convention, and even displays some degree of architectural ambition. Infact its intentions go a good deal further; the long-term plan to integrate the complex with the existing urban fabric is an enormous challenge for a parliamentary institution. However, success in politics is not guaranteed by good intentions. Peter Wislocki argues that despite intelligent planning and sound construction the European Parliament is a victim of the incompatability of architecture and politics on the public stage. Photographs by Marc Detiffe

Like it or not, politicians – and the institutions within which they exercise their mandates – are all too often judged on the basis of "soundbites" and superficial appearances. The European Parliament is an excellent case in point. The recently completed assembly building is intelligently planned, of generally sound construction, and even exhibits some architectural ambition. In terms applicable to elected parliamentarians, one could say that the edifice is well-meaning, conscientious, and quite aware of its duty to be accountable and (metaphorically, at least) transparent. But politics – and architecture – are not always so kind to those who venture onto the public stage.

The project's programme – politically and architecturally – merits proper exposition. At a strategic level, the Parliament responds to its context, provides Brussels with a new public square, and knits the 370,000 square metre complex into the transport infrastructure and

Opposite page *The glass-clad facade facing onto the Parc Léopold.* ***Above*** *Assembly building roof-top view looking north.* ***Above right*** *Interior view of barrel-vaulted atrium leading into the Parliament's 650-seat chamber* ***right***

local network of streets and pedestrian thoroughfares – all popular policies, meriting public approval. Espace Léopold is the name given to the somewhat elongated piazza, created by decking over the existing Gare du Luxembourg. The landscaping is still incomplete, but should eventually provide a generous expanse of pavement cafes, flanked by small shops: a characteristically European urban public realm, onto which the Parliament presents its benevolent face. An arched canopy of steel and glass will mark the new entrance to the realigned Quartier Léopold railway station, from which EU officials and dignitaries will be able to travel directly to Luxembourg, Strasbourg and Brussels National Airport.

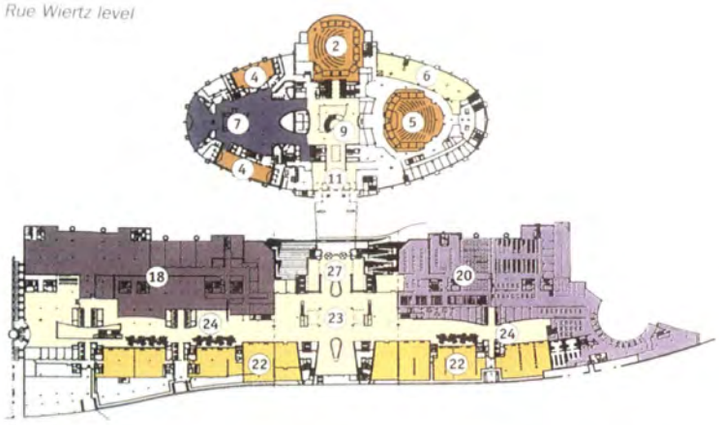
From Espace Léopold northwards, the design reveals a series of layers. A mostly repetitive, gently curving, stone-clad facade has, at its centre, a large arched opening, aligning with the north-south axis of the Rue du Luxembourg, marking the institution's principal entrance. The curves are neither arbitrary, nor wilfully gestural, but follow the geometry of the tracks below the square. Whereas much of the enormous complex is clad in mind-blowing expanses of reflective glazing, the southern elevation has been more humanly scaled. Future office and housing developments will complete the masterplan, with the intention of linking the Parliament complex to the surrounding urban fabric.

The axial entrance leads directly through the centre of the administration's linear megastructure, via an enclosed bridge, giving access to the atrium at the heart of the oval assembly building to the north. Flanking this processional route are escalators up to the Forum, the building's central concourse – reserved for members, officials and invited guests. On either side of the enclosed axis are pedestrian passages, allowing access from the Espace Léopold to Rue Wiertz, and thence to the Parc Léopold. Citizens of the European Union are thus able not only to penetrate the great walls of their legislature, but to glimpse the life within the administrative centre, through "Windows of Europe", as they traverse the linear building's interior.

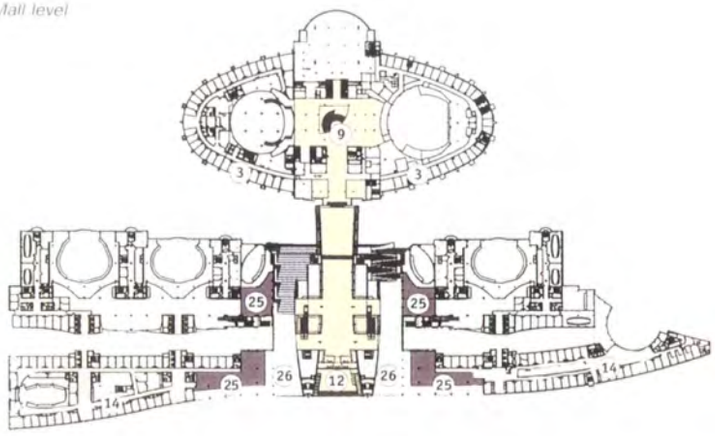
The design of the administrative block, which is scheduled for completion in April 1997, follows a legible hierarchy, with a gradation of thresholds from the public realm to private offices. Thus the public thoroughfares relate directly to the internal streets (quadruple-height, glass-roofed corridors), which in turn are overlooked by the foyers serving each of the three principal meeting rooms in the building. Higher still, the streets are overlooked by individual offices and circulation spaces, and will be animated by escalators.

In order to reduce the building's apparent mass, the office areas facing Espace Léopold

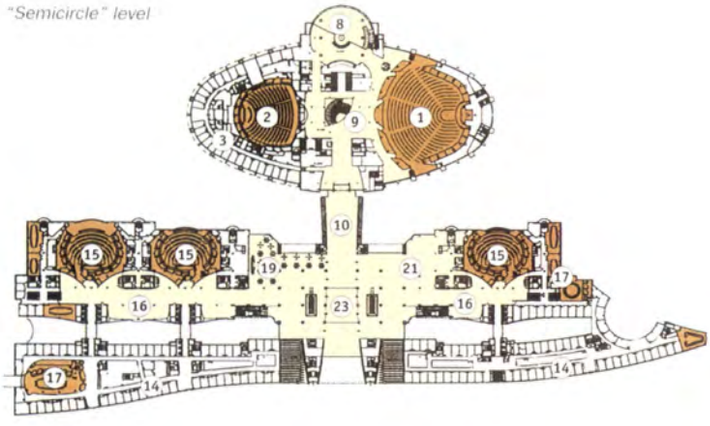
Rue Wiertz level



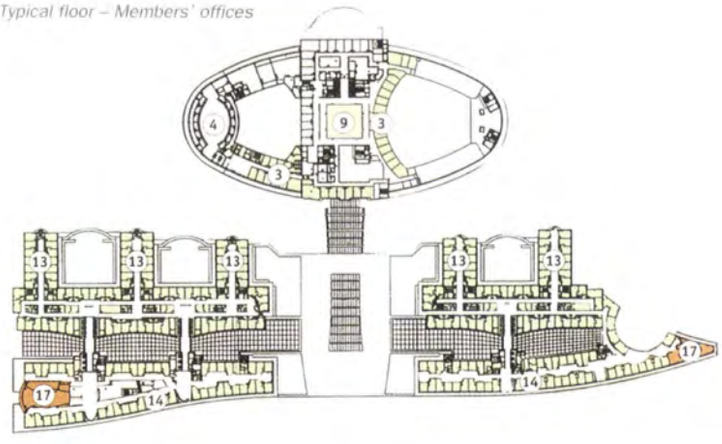
Mall level



"Semicircle" level



Typical floor – Members' offices



Opposite page from top left *350-seat conference chamber. View of interior corridor to members' offices. Reception area representative of the corporate nature of the institution. One of the four dining rooms in the Parliament complex.* ***Below*** *Three-dimensional model of the European Parliament*

Fabien de Cugnac

Project	European Parliament, Brussels
Clients	Société Espace Léopold
Architect	AEL Atelier de l'Espace Léopold sa (Atelier de Genval sa, Cerau sa, Atelier Marc Vanden Bossche sprlu, Atelier d'Architecture CRV sa) CVG & D Studiogroep Dirk Bontinck, CDG sprl
Structural Engineer	Tractabel Development
Contractors	Associations Momentanee des Entreprises; Compagnie d'Entreprises CFE sa; Les Entreprises Maurice Delens sa; Travaux sa; Entreprises SBBN et Six construct sa; Entreprises Jacques Delens sa; R Maes NV
Acoustics	Cauberg et Verbeemen sa Dynamic Engineering sa
Railways	Department Infrastructure de la SNCB Sevice Batiments et ouvrages d'art
Project Management	Coordination et Development Immobilier

are restricted to an overall height of five storeys. The northern flank of the building, by contrast, is taller, bulkier and altogether less inviting. Cellular offices – each immaculately detailed, with ensuite shower rooms and toilets for each elected member – are arranged around raised courtyards, offering most parliamentarians views of the legislative block.

Whilst the administrative building is nearing completion, the assembly chambers contained within the northern, oval block are already in use. Members and officials enter the building from Rue Wiertz, passing through security checkpoints to a central foyer. Three main functions are accommodated at this level: to the west, a visitors' reception; to the north, a conference chamber seating up to 120 people; and to the east, the press conference suite, with adjoining offices for hundreds of journalists.

A generous, gently spiralling stairway rises through the heart of the building. The bridge from the administrative block arrives one level above Rue Wiertz. Ascending a further level, the central circulation space opens up into a generous, barrel-vaulted atrium. It is from here that members enter the Parliament's 650-seat chamber, located on the building's eastern side. A smaller conference hall, for party caucuses and commission meetings of up to 350 people, is located on the opposite side of the atrium, with the members' bar – a crucial element of any democratic institution, immediately to the north.

At the highest level, the southern end of the barrel vault accommodates one of the four dining rooms of the complex. To the north of the atrium, with views across Parc Léopold and the city beyond, is the President's private dining suite.

The foregoing description necessarily omits mention of many details, which, it must be acknowledged, add up to a very well-appointed and generously specified facility. Given the complexity and sophistication of the planning, it is surprising that the Parliament was conceived, back in 1989, as a general-purpose conference centre. The expansion of the European Union, and its government, has forced the legislature to relocate repeatedly. The competition between Brussels, Luxembourg and Strasbourg – the EU's main seats – is intense. The Belgian project fully satisfies the Parliament's programme.

Success in politics is not guaranteed by good intentions, thorough analysis and disciplined execution. An affable personality often wins more votes than intelligence or inventiveness. Sadly, whilst close scrutiny of the parliamentary complex reveals a multitude of clever ideas, many of which acknowledge the need to break down the barriers between the electorate and their representatives and public servants, the final product – by virtue of its scale and ubiquitous curtain walling – remains tainted by overtones of corporate culture and institutional anonymity. **WA**

Dreaming spires of Singapore

Timothy Seow Group Architects

Raised in Singapore, trained in Oxford and inspired by Vancouver, Timothy Seow's architecture is as complex a mix of influences as his background suggests: a combination of the work ethic, programmatic analysis and a sense of what makes the good life. Thus prepared, Seow became a key figure in Singaporean architecture during the seventies and early eighties, thanks to his success in reconciling the condominium tower with the concept of privacy and individuation. After a short period back in Canada, Seow has returned and is now working on a series of large new projects across south-east Asia. With the help of new blood from Canada, Hawaii and the Philippines Seow's "bungalows in the air" are beginning to take on a more romantic, ethereal quality. Text: Timothy Ostler.

Benjamin Yu Pictures Etc... and Tan Wee Khiang Photo Impressions Pte Ltd

Timothy Seow's beginnings as an architect were hardly auspicious. He actually wanted to be a lawyer; but his mother, who was a property developer, threatened to cut off his financial support unless he took up architecture.

It was a nice reversal of the popular stereotype. "When I started at architecture," says Seow, "I didn't even know what it was." There were no schools of architecture in Singapore, and Seow eventually took up a place at the Oxford School of Architecture (now part of Brookes University).

When he arrived in 1958 he was captivated by the city and its architecture. At that time modernism was in its prime, and no-one questioned that it could sit happily alongside Oxford's more ancestral "dreaming spires". Concrete was still unchallenged as the dominant medium, and the favoured approach was one of disciplined sculptural form.

It was also a time in which new forms were

Opposite page *Timothy Seow Group Architects, from left; Colin Seow, Felicisimo Macalino, Kelvin Chiang, Jeffrey Yap and, (seated) Timothy Seow.* ***From left*** *TSG's condominium tower in Setia Budi, Jakarta, draws inspiration from the traditional Balinese gateway. The office tower in Alexandra Road, Singapore is designed to reflect the partnership between its joint clients. Beverley Hills Condominium in Johor Bahru, Malaysia represents a return to many of the themes of Seow's earlier work*

being promoted for social housing. Denys Lasdun seems to have held a special fascination for Seow – his celebrated cluster blocks in Bethnal Green, in particular, were to exert a fundamental influence.

It is perhaps hard to imagine now, but when Seow finished his training in 1963, Singapore was in recession. So when he was invited to complete his second year out in Vancouver he leaped at the chance.

In Vancouver he found the perfect complement to Oxford and Singapore. Whereas training in Britain had provided him with a grounding in contemporary theory and a predisposition to ingenuity. Vancouver showed him how a mature and enterprising economy could use modern architecture not just for social housing but as a means to accommodate the good life.

His experience at Oxford had been much the same as any other architecture student anywhere: money was tight, with very little time available for non-architectural leisure pursuits. His employers, Thompson Berwick Pratt, set him up with a luxury apartment with associated swimming pool. He learned to love the West Coast lifestyle.

It was a world apart from Singapore's celebrated work ethic, and in the end it was Seow's residual sense of discipline that led him to resist this lotus-eating lifestyle in favour of a more hard-working one back at home. "I thought it was too good for a young architect and I had to sweat it out at first," says Seow. "That's the Singapore way!"

Architecturally, Singapore at the time still possessed many of the characteristics of a third-world country. Although the Housing Development Board (HDB) was in the middle of a massive programme to provide housing for hundreds of thousands of people, the first commercial buildings with first-class standards of finish would not be built until at least the mid 1970s.

After several salaried positions that progressed to junior or equal partner, Seow set up his own firm, Timothy Seow & Partners, in 1974.

Armed with planning skills learnt at Oxford, Seow with his partners set about reinterpreting Singapore's by-now-established slab block tradition for a new clientele. In the process he pioneered a new from of tenure in Singapore.

"Beverly Mai, Futura, Maxima and Westwood were the first four condominiums that came out" says Seow. "After that a lot of people came out with more condominiums, because they suddenly realised that where you cannot afford to have a pool by yourself you can share it as a group. Then you can enjoy the pool, the tennis court and all the rest of the facilities."

Seow was very familiar with this particular building type from his time in Vancouver, and slipped easily into the role of designing a

Opposite page *Futura Apartments; Seow's curvilinear bays helped to define the luxury condominium in Singapore and were often specifically requested by other clients.* ***Below from top*** *For the hotel and commercial centre in Cirebon, Indonesia, the traditional local shopping pattern is emulated on the roof. King George Centre, Surrey, near Vancouver, Canada. TSG aimed to reverse the normal situation where a shopping mall turns its back on the street. In Laguna 88 (Eastwood), the design was rigourously dictated by the client's requirement that every property would have a view of the lagoon*

▲ Benjamin Yu Pictures Etc... and Tan Wee Kiang Photo Impressions Pte Ltd

similar kind of development in his own country. Even if he was motivated primarily by the natural desire of a young architect to cast off the shackles of oppressive tradition, his invention came just at the right time for an affluent new generation of Singaporeans, themselves as eager as Seow to shed any links with the country's ubiquitous HDB blocks. In Seow's innovation they saw the opportunity to enjoy upmarket accommodation without the cost of an individual house.

The level of integration of this, Seow's most important series of condominium towers, is striking when compared with other more workmanlike slabs going up at the time. Articulation on plan is probably the most consistent feature. In his residential blocks this usually combined with an explicit preoccupation with maintaining privacy for each unit. Beverly Mai, Maxima, Westwood and Futura illustrated this succinctly. With four, one, two and three units per floor. At Beverly Mai, Seow pulled the four units apart on plan to form a Lasdunesque cluster block, in the process subdividing the building into Kahn's "served" and "servant" zones. At Maxima, Seow set out to prove a point.

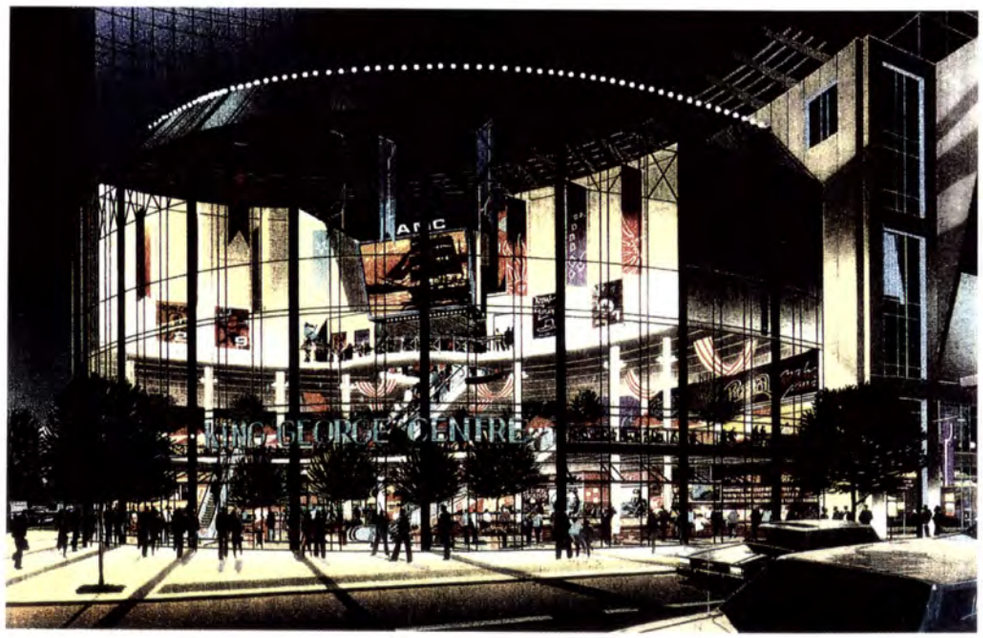
The restricted site was considered to be big enough only for one bungalow, but one bungalow on its own would not have been economically viable. Seow took the opportunity to go up twelve floors including a two-storey roof-top penthouse. Each unit had a whole floor to itself.

"If one speaks of the bungalows in the sky," says Seow, "this is the ultimate. Its really one unit per floor. Even though I did not have party walls on Beverly Mai, Westwood and Futura, nevertheless it was still two or three units per floor.

" I was trying to prove my point that an apartment is like a bungalow, (in that it really has no neighbours at all), except that it's in the air!"

The same development would be impossible today: Seow had the advantage of operating in an environment that was only loosely regulated. "I was quite lucky. In fact a lot of people thought my career would end after one of those buildings."

This was anything but the case. With the curvilinear bays of the Futura apartments Seow created an image that led many subsequent clients to request specifically the same treatment. In most condominium towers Seow



Left *TSG's condominium for Pidemco in Stevens Road, Singapore is one of several recent TSG buildings that pay reference to Singapore's shophouse tradition.* ***Below left*** *The Sentra Westin Karkita was explicitly inspired by the heroic spendour of art deco Manhattan.* ***Below right*** *The Tong Building: Timothy Seow & Partners' bold use of geometric forms sets it apart on Singapore's busy Orchard Road.* ***Opposite page*** *TSG's project for a corporate centre for the Excelcomindo mobile phone company brings light, water and radio waves together at a focal point*

Benjamin Yu Pictures Etc., and Tan Wee Kiang Photo Impressions Pte Ltd

continued to articulate individual rooms, developing the characteristic curvilinear "folded curtain" effect that became a trademark feature.

The most striking of these is Horizon Towers. After a series of towers, Seow was presented with a slab block to accommodate six units per floor.

"It was the first time I was confronted with a slab block. All slab blocks in Singapore Housing Board are either balcony or corridor access." Seow was required to put forward a novel approach, because the developer was being awarded the project on the basis of design quality as well as price.

Seow's solution was to break up the slab into a series of towers linked by lift blocks. Every unit was separated from its neighbours. Smaller rooms such as bathrooms are pulled out to form smaller tower-like tubes that prefigure Seow's soaring tower projects of the nineties.

The way that Seow transformed a slab into a succession of point blocks draws attention to the fact that centralised lift lobbies result in a fundamentally more private format than a slab with deck or corridor access, which both emphasise the communal dimension.

In 1985 Seow opened an office in Vancouver and began working as a developer. This second period in Vancouver proved to be an important period for his future development, allowing him to take stock and broaden his range of influences. He developed a close collaboration with Vancouver architect Paul Merrick. Also working with Merrick were Kelvin Chiang, Hong-Kong-born and a graduate of the University of Manitoba, and Seow's nephew Colin Seow, an alumnus of the University of Oregon, later a tutor at the University of British Columbia.

The two Seow's and Chiang began working together. "While Tim is my uncle," says Colin Seow, "it was with some surprise that we found out that as designers we actually complemented each other." Projects that belong to this period include King George Center, a retail development in Vancouver (developed with Andrew Cheung Architects) that addressed the issue of how to prevent a shopping mall from turning its back on the street. They were later joined by Jeffrey Yap, whose dazzling career seems to have involved practising in every country in East Asia.

While Colin Seow's approach is sharply analytical, three years' practice in New York had granted him a certain affection for Art Deco and a corresponding sensitivity to how a building meets the sky. Kelvin Chiang's approach focussed on the need for cultural identity, while Jeffrey Yap brought with him formidable expertise in hotel and resort developments. The fourth partner, Felicsimo Macalino, had over two decades of experience in getting buildings built (he now heads up the production department). These combined skills meshed nicely with Timothy Seow's own involvement with apartment towers and commercial developments.

In 1993 a series of limited competitions for clients across Asia, but especially Indonesia, had borne fruit and Timothy Seow returned to Singapore, his partners following on shortly after.

The net effect of all this is that the new firm of Timothy Seow Group Architects has been enriched with a fresh set of influences – amongst them a strengthened concern with the contextual aspects of the brief.

This is particularly appropriate in view of the number of Indonesian projects with which the firm is involved. Whereas Singapore is arguably lacking in tradition, Indonesian clients are proud of, and very attached to, the cultural traditions of their archipelago.

So while maintaining Seow's preoccupation with modelling the facade, the condominium at Setia Budi in Jakarta is designed to evoke convincing and uncontrived echoes of the traditional Balinese Hindu gateway at Chandi Bentar. In this and other recent projects the tubes of previous towers have become pinnacles, the surface material has become lighter and the weight seems to peel away as the building advances in to the sky. **WA**

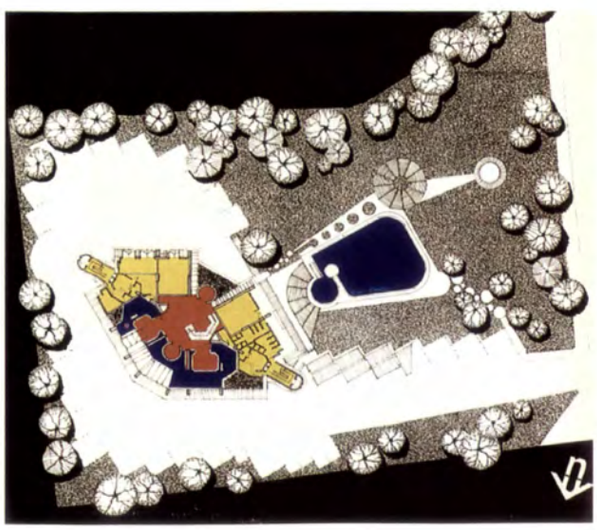
Benjamin Yu Pictures Etc . . . and Tan Wee Khuing Photo Impressions Pte Ltd

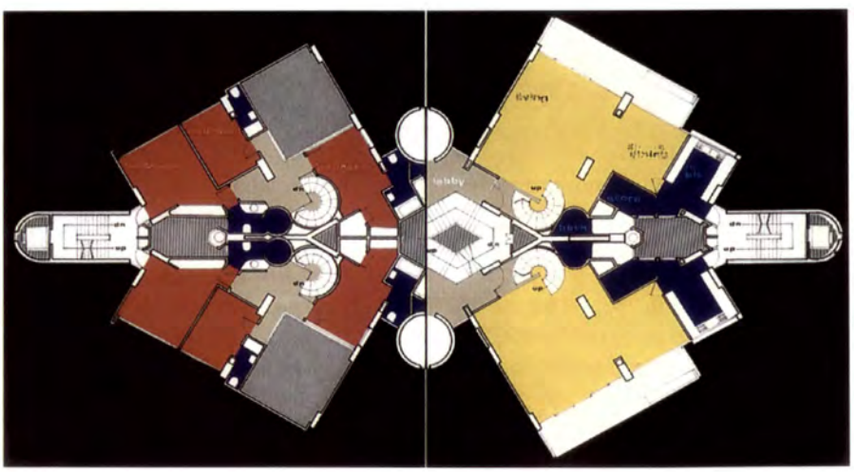
Beverly Mai Apartments, 1974

It was at Beverly Mai that Seow took the opportunity to put into practice ideas that he had learned from observations of Denys Lasdun's cluster blocks. The conventional residential tower in Singapore had an H-shaped plan, with four units per floor and therefore four party walls. Kitchens and bathrooms were on the outside, where it was the tradition to hang washing to dry from poles protruding Heath-Robinson-like from the windows. Seow had never liked this. The cluster idea therefore not only allowed each unit to become detached, it also afforded the cosmetic advantage of locating service areas on the inside of the plan in the Western tradition, so that washing could be dried within the void.

The units themselves were not conventional flats but two-storey maisonettes – a radical new idea in Singapore and one that, like the cluster principle, maximised occupants' privacy.

Below left *Beverly Mai site plan.* ***Below right*** *Typical floor plan. The upper floor is on the left, the lower floor on the right*





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Maxima Apartments, 1973

In the early seventies, Seow managed to persuade clients that condominium apartments can also be for the higher end of the market. He realised early on that with the scarcity of land on a small island like Singapore, bungalow living could only ever be for the privileged few. At Maxima, Seow's concept of "bungalows in the air" is most literally applied.

As is often the case with architects early in their career, his ability to innovate was undoubtedly enhanced by the fact that he was working for family clients – in this case his parents.

There was only room for one bungalow on the site, and no-one had considered developing it as high-rise, perhaps because of its upmarket location. Thus, when Seow was able to demonstrate that he could use it to accommodate not only nine "bungalows" but also a double-storey penthouse, his parents were naturally delighted.

As a natural consequence of this arrangement, lift lobbies on each floor are private to each flat. The building's relatively squat proportions are made more slender by means of deep vertical modelling, against which balconies provide a strong rhythmic contrast.

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Draycott Tower, 1978

"The client said, 'I like your curves but I like it cheap.'" In response, Seow increased the scale of his tubular towers to create circular flats without subsidiary bathroom towers, thus reducing the cost by 25 percent. The effect is powerful, simplifying Seow's normal complex forms into a group of three slick tubes, with (probably accidental) echoes of Karl Schwanzer's BMW Headquarters in Munich.

The 34-storey block provides 86 flats and six double-storey penthouses. Nearby is a low-rise development with three clusters of four-storey double-storey studios and 24 bachelor flats.

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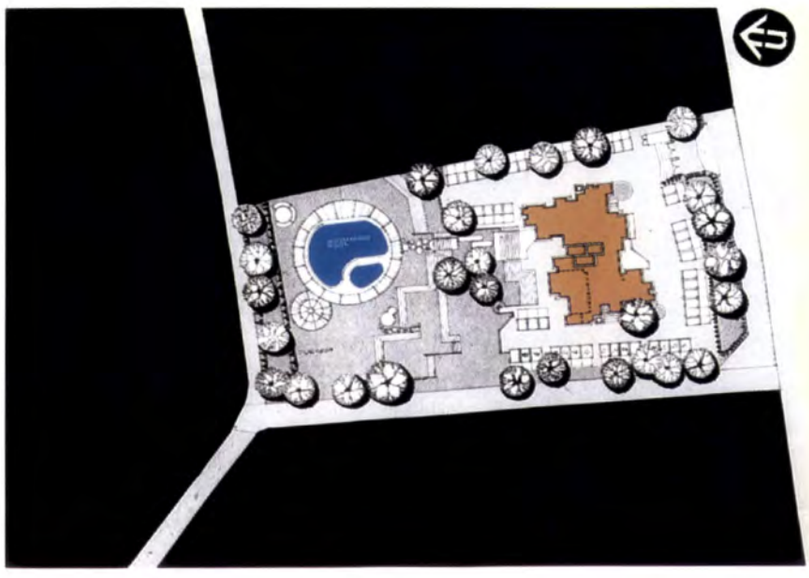
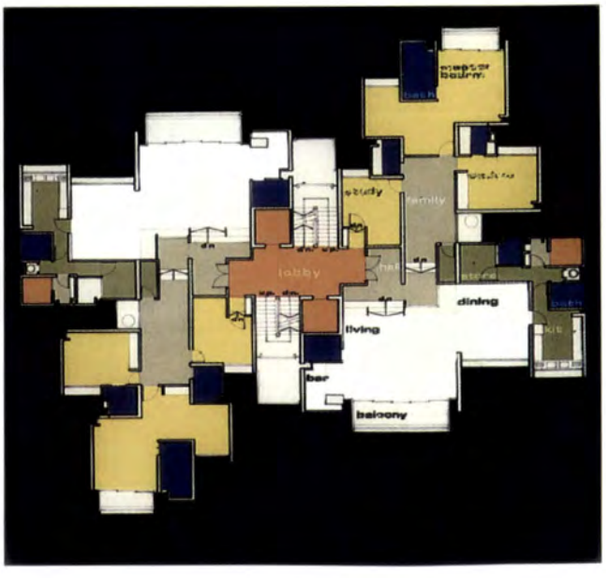
Westwood, 1974

With only two units per floor, Westwood could almost be described as "semis in the air" were it not for the fact that here there is no party wall: the central lift lobby acts as a sound buffer on each level. Seow rejected the use of curves for this tower, choosing instead to concentrate on creating the maximum degree of articulation. As a result the plan has a freedom and informality that could be mistaken for a low-rise building, and has the added benefit of breaking up the building's bulk, with niches to conceal the inevitable washing poles. Internally, Seow continued the articulation to include split level floors, which allowed him to restrict internal walls to only those required for privacy.

Like almost all of Seow's condominium apartment blocks, Westwood is topped by a prominent penthouse which projects beyond the rest of the building. Here the roof profile is irregular, paralleling the irregularity of the plan.

Below left *Westwood site plan.* ***Below right*** *Typical floor plan*





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Above left *View of Futura Apartments from street level.* ***Above right*** *Close up of entrance.* ***Plans below from left*** *Futura site plan. Typical floor plan, and penthouse floor plan*

Futura Apartments, 1976

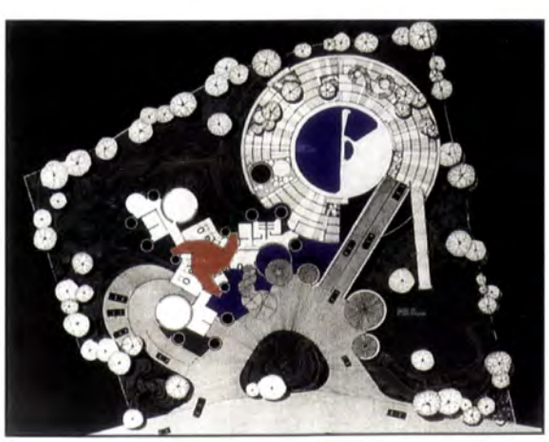
Futura is the last of four early condominium towers that established Seow's reputation, and is like no other in Singapore. Although Beverly Mai, Maxima and Westwood were behind him he was still only in his third year after qualification and working for Seow, Lee & Heah (no relation) when the commission came direct to him. The curved cantilevers defining each apartment's living room convey unmistakable echoes of Bertrand Goldberg's Marina City in Chicago, completed when Seow was in his second year at Oxford. But Futura asserts its own logic, growing out of the client's rejection of the rectilinear balconied appearance that was, at the time, universal throughout Singapore.

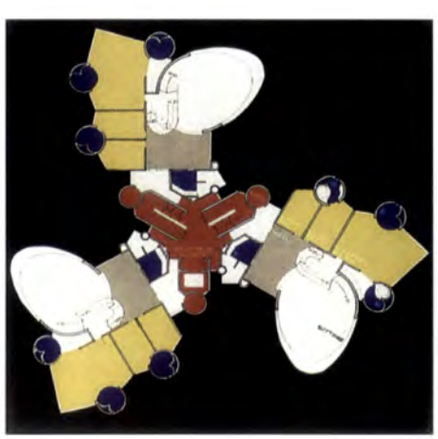
"He said, 'Can you design me a building with no balcony?' It was quite a challenge for me. So I was thinking, 'Well, either you curtain-wall the whole thing or what else?' At that time every building in Singapore has got this band: curtain-walling had not come to Singapore at that time. All architects only designed buildings with a band – there was no other architectural language. He said to me 'I don't want to see that band again.'"

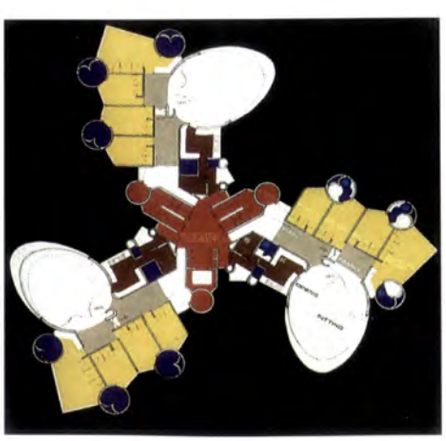
The design follows on from the principles Seow established in Maxima. Although here there are not one but three units per floor, effective detachment of individual apartments is maintained, each of the three "stacks" of apartments being served by its own separate lift (there is also a large central service lift).

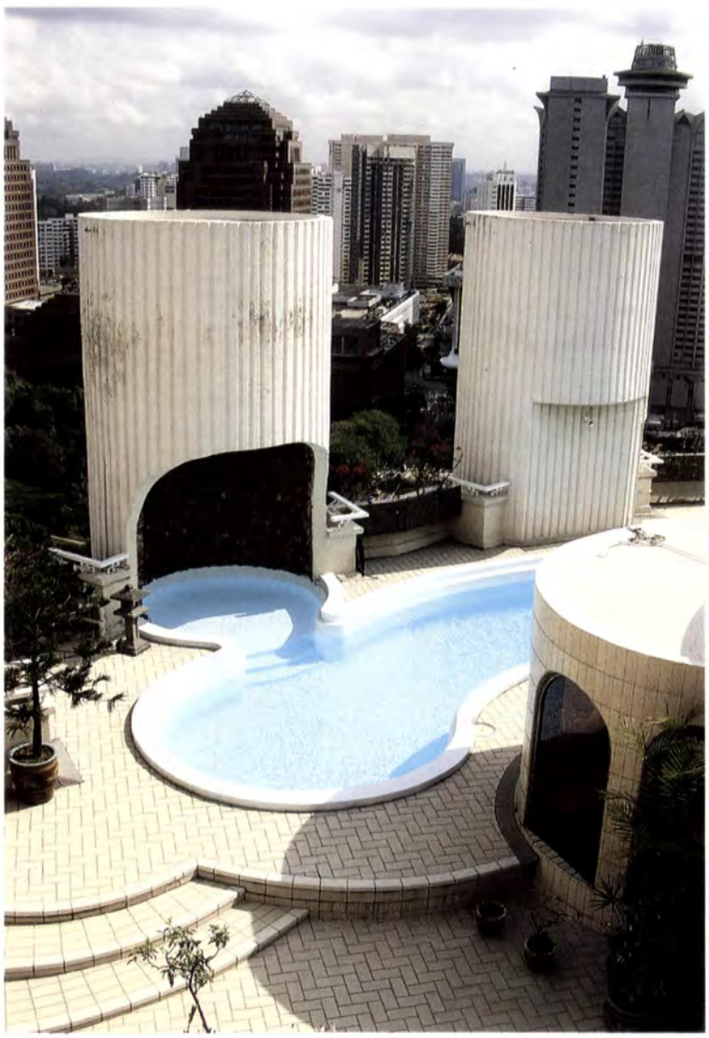
Seow's design initially provided curving planters at each level, which with hanging greenery might well have produced a unique local landmark itself. But the client used the money to install air conditioning, so Seow changed the planter into a wide curving platform (the client forbade a straightforward upstand), raking the sills of the windows outwards to create a strip of windows with trapezoidal panes and a cockpit effect inside.

At ground floor level, Futura was also influential in providing underground car parking so that the grounds could be properly landscaped.









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Horizon Towers, 1984

Horizon Towers presented Seow with the task of designing a slab block to provide 200 flats and 12 penthouses. Given Seow's well-established views on slab blocks, it was perhaps a little like asking a teetotaller to design a brewery. Seow's design rejects the conventional balcony or corridor access, universal among Singapore slab blocks, creating what might be called a "chain block": effectively a linked series of towers with separate vertical circulation.

"I said, 'Why can't we have a tower within a slab block? Every part of the building is a tower block: one lift, two units; one lift, two units; ... and they were all separated from each other.'"

The building also marks a further step in the development of Seow's characteristic tubular subsidiary towers: "All my service areas were tubes," says Seow. "All bathrooms in Singapore were external not internal, so you always end up with the same set of high windows. Again, the client wanted to break away from all that." Eventually the tubes became structural elements eliminating the need for columns. "So I don't have columns, and I solved the bathroom problem – it was like killing two or three birds with one stone."

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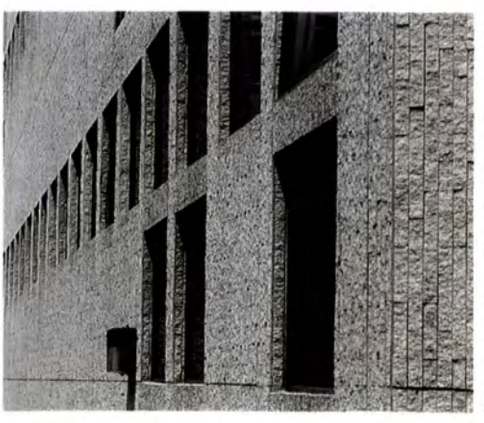
Claymore Point, 1984

Claymore Point is located just off the prestigious junction of Scotts Road and Orchard Road, in a zone devoted to luxury hotels and upmarket residential developments. With correspondingly high site costs, the onus was on Timothy Seow & Partners to design a scheme that was dense enough to be viable.

In contrast to Futura, where the client took an actively critical role in developing the design, for Claymore Point the client – a Korean based in Hong Kong – was effectively absent for much of the design process (he later fell foul of the Hong Kong authorities and the project was taken over by another client). Perhaps understandably, Seow's reminiscences of designing this building therefore carry little of the enthusiasm and affection he retains for Futura. According to him, numerous ideas were tossed around the office without great success until someone suggested that perhaps a grid was the answer. This must be considered successful in providing a neutral foil against which the plan perimeter varies. Thus disciplined these variations work to the building's advantage, animating the grid and preventing monotony while never threatening the overall sense of order. For instance, the first eight upper storeys actually recede within the grid, creating steadily widening ledges. In other cases the grid is exploited to create balconies of varying sizes. Meanwhile the two lines of small square windows on either side of the granite-clad core's outer corner provide a dramatic contrast in scale.



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King's Court, 1993

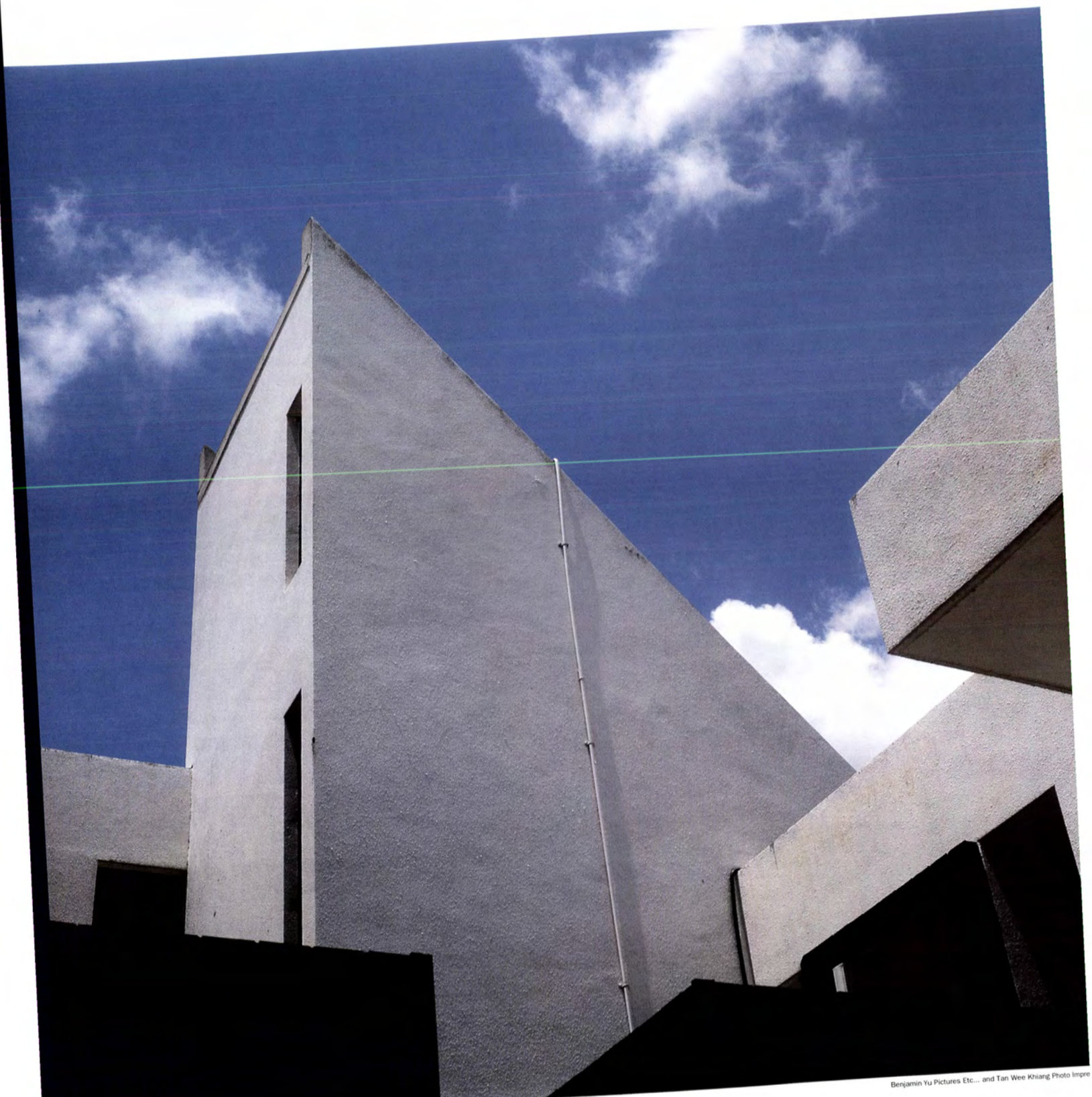
King's Court was the subject of one of the limited competitions that Timothy Seow, Colin Seow and Kelvin Chiang won while still based in Vancouver. Unfortunately the client decided not to proceed with their design.

For this project the design team was inspired by the shophouse, Singapore's classic colonial building form in which, characteristically, family and commercial life are united. Belatedly, Singapore has recognised its importance, and today, it has become the basis of a refurbishment industry. TSG Architects themselves are based in one such shophouse in a part of Chinatown that is the closest that Singapore comes to London's Covent Garden.

A shophouse's facade defines the street, and the pavement passing through arches in the party walls. Inside, the long narrow plan is articulated by one or more courtyards. While such deep voids might, in any other geographic location, remain largely in shadow, in Singapore they are illuminated daily by the midday sun, and allow a constant awareness of the outside, even in the centre of a very deep plan.

It was this interior spatial organisation that TSG used as a starting point. "We've taken the traditional shophouse," explains Colin Seow, "disassembled it, tried to distil the essence, and reconstructed it in an abstract way."

Whereas the terraced housing follows a rectilinear pattern to reflect the character of the surrounding neighbourhood, the semi-detatched houses follow the natural contours of the site and the gentle sweep of the roadway. Light wells perform an orientation function similar to that in a shophouse. Meanwhile, if all the doors are opened, the entire ground floor becomes one big space for parties or even just for ventilation. The curved roof planes shade the roofs from the heat of the equatorial sun.



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Mediterranean Townhouses

Mediterranean Townhouses is a prime example of how an architect's imagination can add value to a site. The location, in Shelford Road, had been rejected by most developers as unusable because of its steep slope. This may have been true using a conventional approach; but the incline made the site ideally suited to a more imaginative approach employing some of the terracing principles explored by Denys Lasdun, which in turn could be said to have originated in the hill town tradition.

Timothy Seow realised that by terracing the site, and building the houses stepping down the hill, not only was the site eminently buildable but also every house would have a view. It also provided the opportunity to create a private street running through the development. This has proved very successful with occupants, who have taken great pleasure in personalising their individual entrances. Solar panels were fully integrated with the roof design.

The project received an honourable mention from the Singapore Institute of Architects.

Menara Rajawali, 1997

Menara Rajawali is a corporate office tower with banking halls. Project Director Colin Seow was strongly influenced by his admiration for the Rockefeller Center, with which he had become familiar while working in New York. The tower as a whole has a layered quality, different laminations reaching different heights. Meanwhile the centre of the tower steps back leaving the twin bays to soar free. The twin pinnacle motifs are a conscious reference to Art Deco in their "heroic" quality.

"The whole idea of a corporate client", says Seow, "is that they want to create an identity, to project a very strong image, to be different and to be aggressive – but not something which is merely fashionable. They want something of a more enduring nature... We decided to come up with something with a distinct silhouette and form but which also met the client's needs."

Comments Timothy Seow, "When we did Rajawali this is still using the core concept and pinnacles of the early apartment blocks but in terms of expressing an intentional spirit and character of the building rather than merely as an expression of structural considerations."

Gateway Towers

Gateway Towers, a condominium development, currently in the permit phase, in Jakarta is representative of the firm's new sensitivity to cultural context combined with a continuing interest in how the building meets the sky. Compared with culturally-bereft Singaporeans, Indonesian clients identify very closely with their national culture, and it was during research into Balinese architecture that Seow was immediately struck by the symbolic power of the Chandi Bentar, an Indonesian icon found all over the country. It takes the form of two tapering, elaborately decorated structures forming a gateway. TSG's Gateway Towers, winner of a limited competition, skilfully interprets the overall form of Chandi Bentar, combining it with a surface treatment that develops from brick to elaborately articulated curtain walling at high level. Phase II is designed as a building placed in the centre of the axis, terminating the vista, while landscaping by Michael White will adopt a specifically Balinese approach.

The building's materials owe something to the fondness Seow developed for timber while in Canada: "Timber has a warmth that you cannot equal in any other material." Although timber was not appropriate for Gateway Towers, Seow's choice of brick is motivated by a general desire to move towards more congenial materials.

"A lot of it is the marrying of a warm rustic material with the technology we are having to accept today – like curtain walling and steel. At Setia Budi we are trying to get away from the skyscraper building, where everybody ends up with curtain-walling, and the next thing is Alucobond."

The use of different materials at different heights also takes into account what might be described as "architectural atmospheric perspective" – the further the eye travel up the building, the more textural detail becomes harder to make out, and the more the building itself seems to dematerialise. This is characteristic of a symbolic change in Seow's architecture since returning from Canada: beforehand, his tall buildings tended to terminate in a projecting penthouse. Now rooftops are more likely to recede, lending his towers a more romantic quality.

"At a distance," says Colin Seow, "you appreciate the project in sihouette and undestand its significance as a split tower representing a gateway. Up closer, we have tried to anchor the building by bringing up the 'earth' materials beyond the first level. As we move up the building, the materials gradually transform into steel and glass, its forms begin to interact and reflect more the nature of the sky rather than the ground."

Ponderosa Condo

Consisting of a 38 storey luxury apartment tower, a 28 storey condominium block and service apartment townhouse, Ponderosa began as a small low-rise development not far from the Malaysian border with Singapore. The relatively deep-plan units were explicitly inspired by the Singapore shophouse tradition, with daylight spilling down to ground level through light courts. Underlying the entire development was a car park with reflecting pool above. Residents leaving the car park would emerge from relative darkness to be confronted with a view across the forest landscape.

This scheme was revised in the light of comments from the client who was looking for a much higher density and a more sensuous mode of expression. The greater intensity of development made the original orientation impractical and the scheme became a series of towers with Futura-like balconies in varying configurations.

Cascadia

Cascadia is a condominium development located near Bukit Timah, Singapore's only remaining area of primary rain forest. Despite this it lies in an established residential zone, and the competition brief was for a classical scheme – the dominant style for speculative condominium developments in Singapore. The design shows an explicit influence from Knightsbridge's Queen Anne style. Seow sought to use natural materials to make the building as warm as possible.

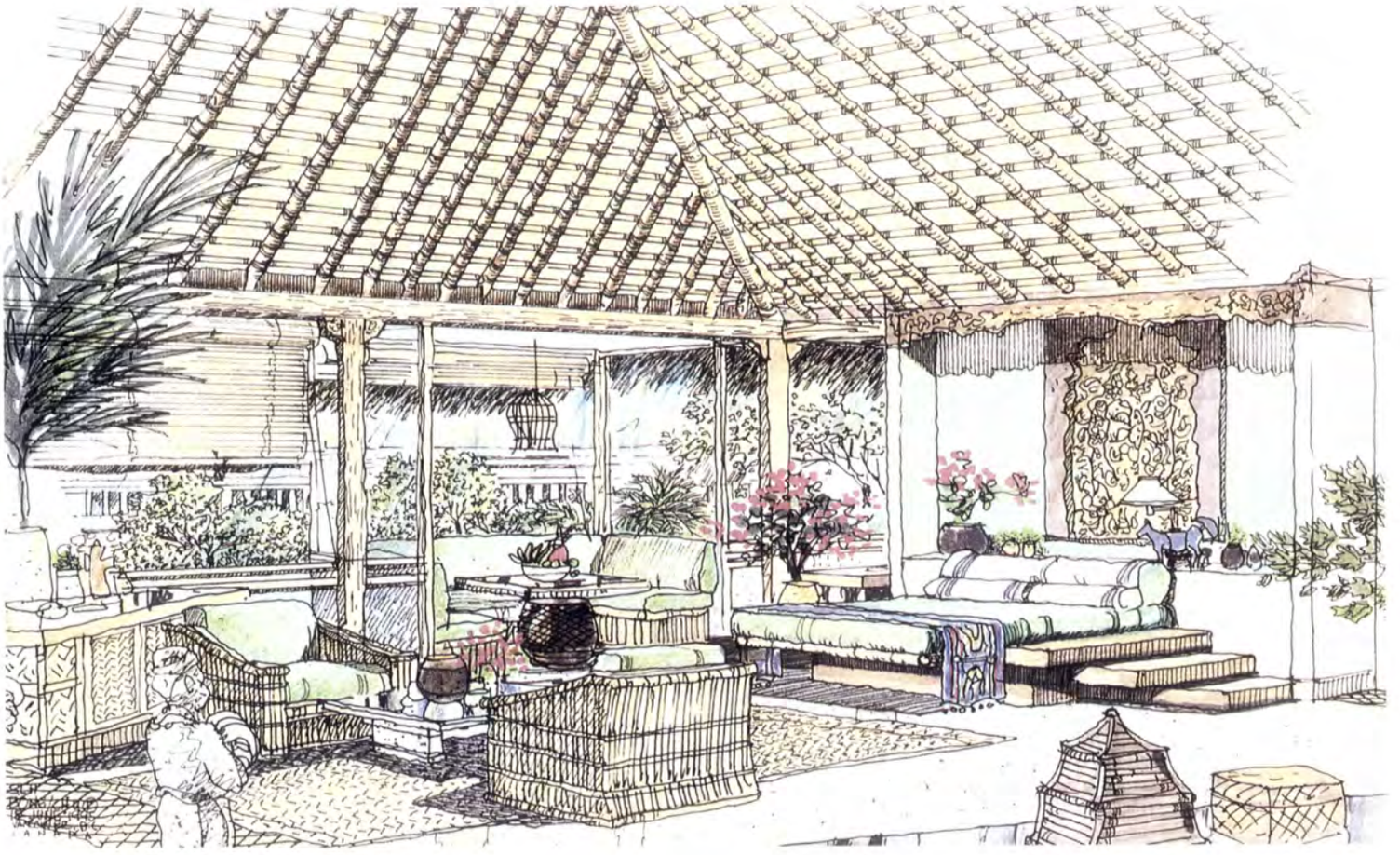
Offices at Alexandra Road

Projects for tall buildings in a city centre often come to be viewed by both client and architect as a kind of monument to certain enduring qualities. The proposed Alexandra Road office tower on the outskirts of Singapore's business centre is one such building.

Situated on a hill, the building's curved shape is designed to follow the hillside contours.

The client is a Malaysian company that entered into a joint venture with a Singapore developer in order to build the project. TSG therefore conceived the building as a symbol of this relationship, the curved wall of the tower volume oversailing the curve of the entrance facade like two intersecting arches. A pool reflects the point where these two elements meet and, by extension, the symbolic bond between the two countries.

TSG explain that the building represents both dynamic and static qualities, its curving shapes contrasting with stable and more anchored vertical forms. The rising steps of the facade treatment, meanwhile, are intended to symbolise growth.



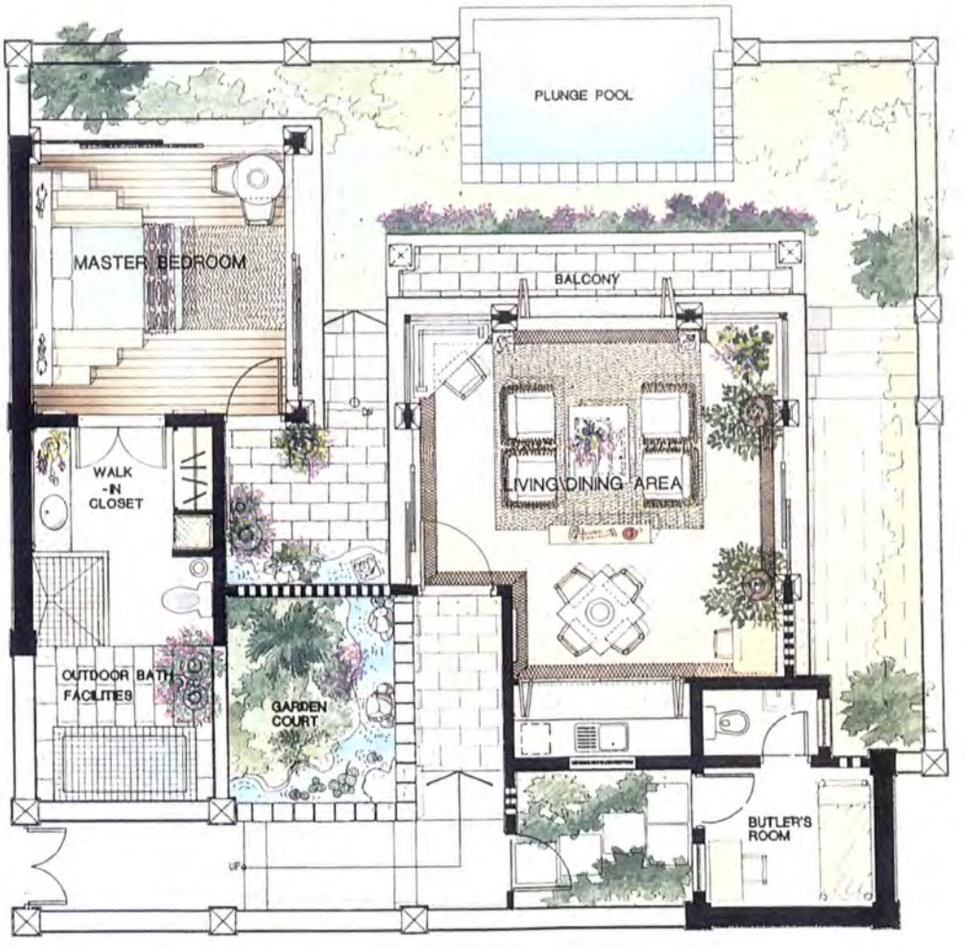
Vila Sheraton Senggigi

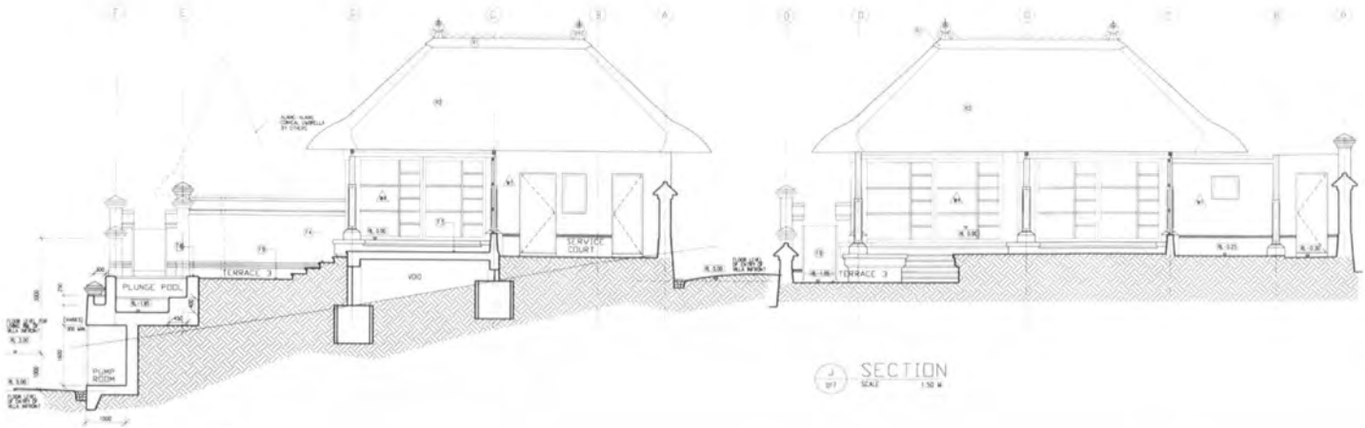
The Vila Sheraton is designed to sit gracefully in its seaside context. Built on a quiet site just north of the Sheraton Hotel, it is a condotel: an arrangement where units are sold to individuals and sub-let on their behalf when they are not there.

The project director is Colin Seow. "It was a place to get away from it all and re-group," he says. "As such it was designed to be in some ways introverted as well as to be in a fairly isolated spot. The idea was to minimise the effect of feeling crowded. We played on the idea of the microcosm."

In the centre of the village is a club house and a large pool. Surrounding this are four clusters, each containing five villas clustered around a service centre and courtyard. Each of these is in turn made up of a cluster of pavilions, grouped around a plunge pool "for soaking and looking at sunsets".

Each villa was conceived on a grid as a sequence of axially located spaces in which the concepts of inside and outside flow into one another. Roof forms derive from those of the High Balinese style.





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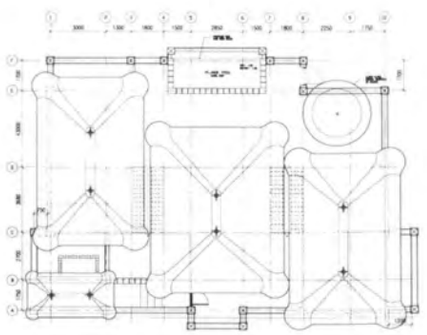

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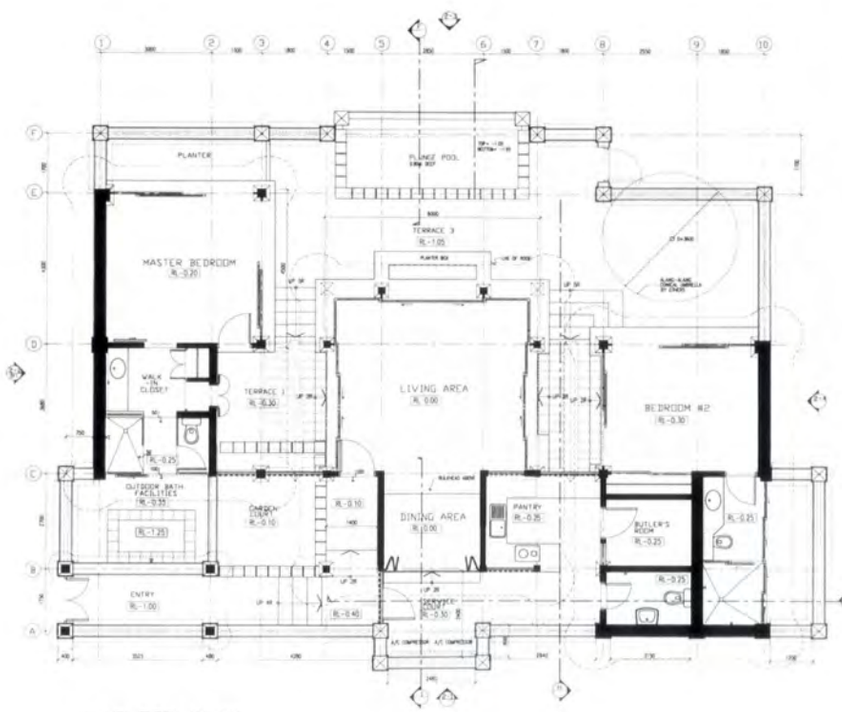

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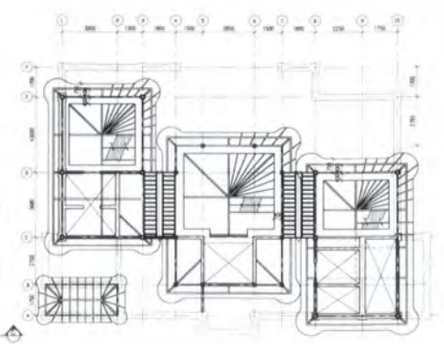

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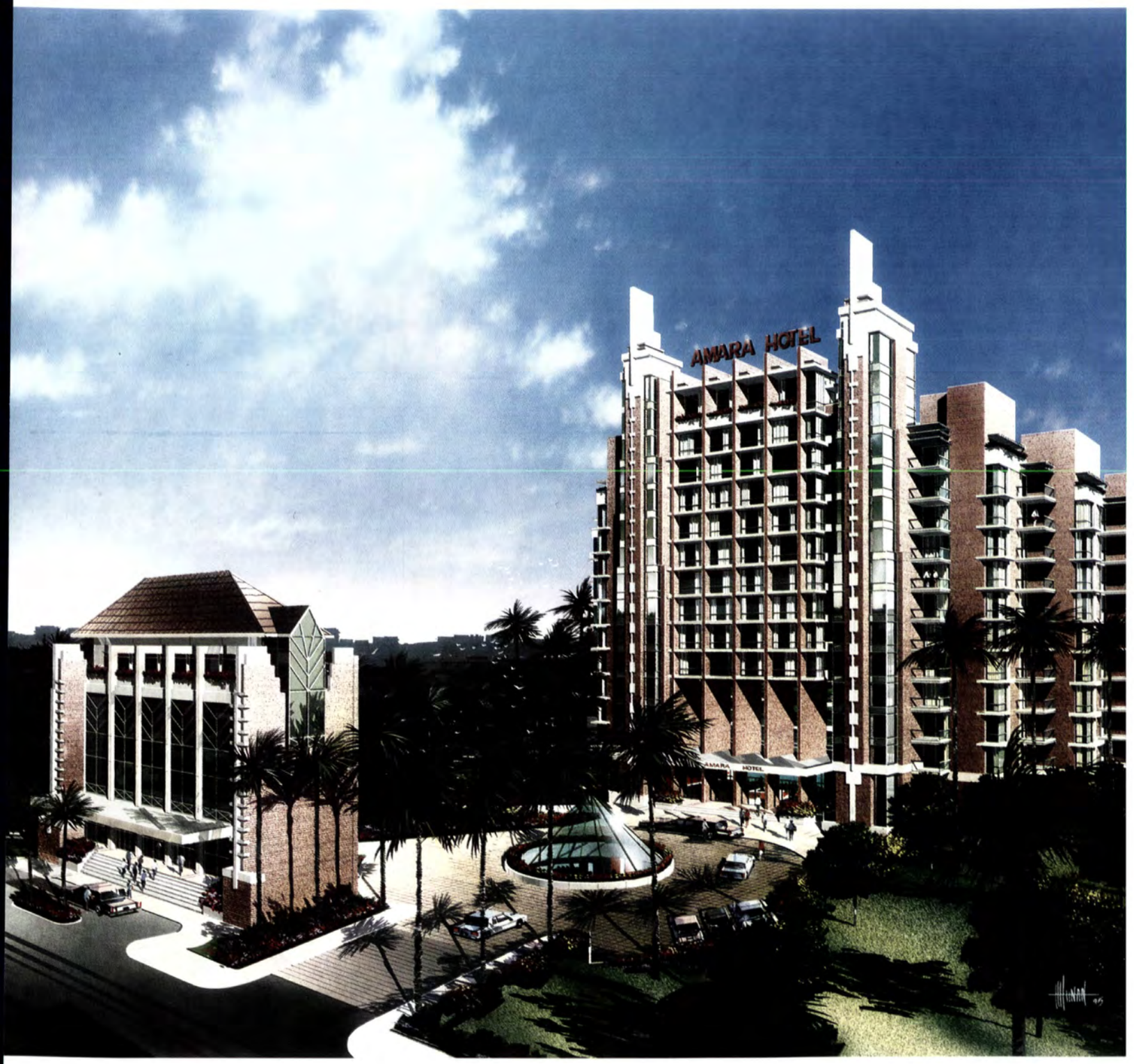

AMARA HOTEL

TSG's work for the Amara Hotel chain

In the world of international hotels the role of architecture as a unifying force has only been partially explored. In their work for Amara, a relatively young chain based in Singapore, TSG developed an architectural language that remains consistent throughout a series of projects in Singapore, Yangon, Chengdu and Jakarta, while allowing individual interpretation according to local tradition. This language began as a side-effect of the first project in the series, an extension to the Amara in Singapore, where a cruder existing roofline was replaced with one that more closely reflects the growing sophistication of Singaporean culture. Meanwhile, the resort hotel in the capital of Myanmar (Burma) derives its inspiration for form and architectural vocabulary from the Buddhist pagoda. In Myanmar, Buddhism is the national religion and the country's cultural history has been given powerful emotional expression in its temples. While the temples remain sanctuaries for sacred relics, the garden hotel is designed to create a sanctum for relaxation and retreat.

Office Towers in Manila, begun 1996

The tradition of twin towers is becoming widely established in south-east and east Asia. This pair of office towers represents TSG's largest contribution yet to the task of upgrading Manila to the standard of other Tiger economies. The project is a finalist in a competition with a brief including a mixed commercial development, a service apartment block and two condominium blocks. In this project Seow's spires are set in a slightly different context from some of his other recent work. Here they occur not as the culmination of a generalised upward trend, but together as part of a discrete component in a large-scale modular composition, standing on a podium containing a retail plaza and car park. According to TSG the multiple layered approach to the facade and volumes represents a shift away from the typical glass box typology.

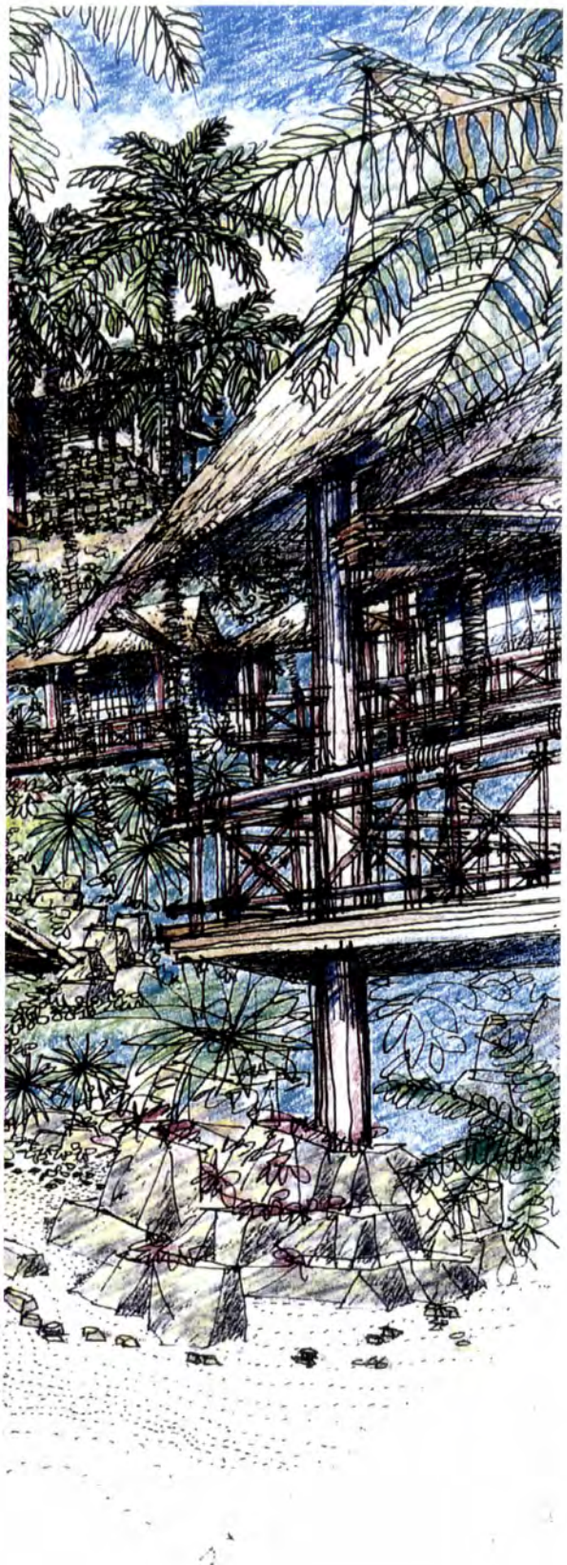
Stevens Road Condominium, begun 1995

The subject of a limited competition, the brief was to create a luxury 100-unit mid-rise resort-like condominium in the middle of Singapore's urban environment. The site was very challenging: it was pie-shaped and very narrow. Most competitors chose to design their scheme as one straight block of accommodation.

"What we did," says Kelvin Chiang, "was to try to create an urban oasis... The entire ground floor is like a garden." Visitors arriving by car and on foot both use the same entrance.

All units were different sizes and provided up to the maximum area permitted by planning regulations.


CP CRUZ '95



Menado Resort

This development features 80 resort villas located on a steeply sloped site and set around two bays of water. The approach to the site reveals its spectacular ocean views upon arrival.

One of the main programme requirements from the client was that the resort should be uniquely memorable to the guests. In response to this challenge, the roof of TSG's unique, multi-layered reception pavilion takes the abstract form of a bird sitting by the water ready to take flight.

The master-planning incorporates several water features, meandering paths and different pockets of space for rest and relaxation. All of the buildings are designed to embrace the steep slope of the land, and each villa enjoys a view of the water.

Along the approach to the resort restaurant there is a handicraft village, located on an island within a small artificial lake. The restaurant wraps around the lake, opening up the water on both sides. On one side is the lake which features a small performance stage, and on the other side is the ocean with beautiful sunset views.

The forms and materials of the individual villas are influenced by indigenous architecture: an open plan is developed to take advantage of the view and maximise cross-ventilation; long roof overhangs provide sun and rain protection; extensive landscaping, meanwhile, unifies each indoor/outdoor bathroom as one continuous space.

Crown Hotel Plaza, Gajah Mada, begun 1993

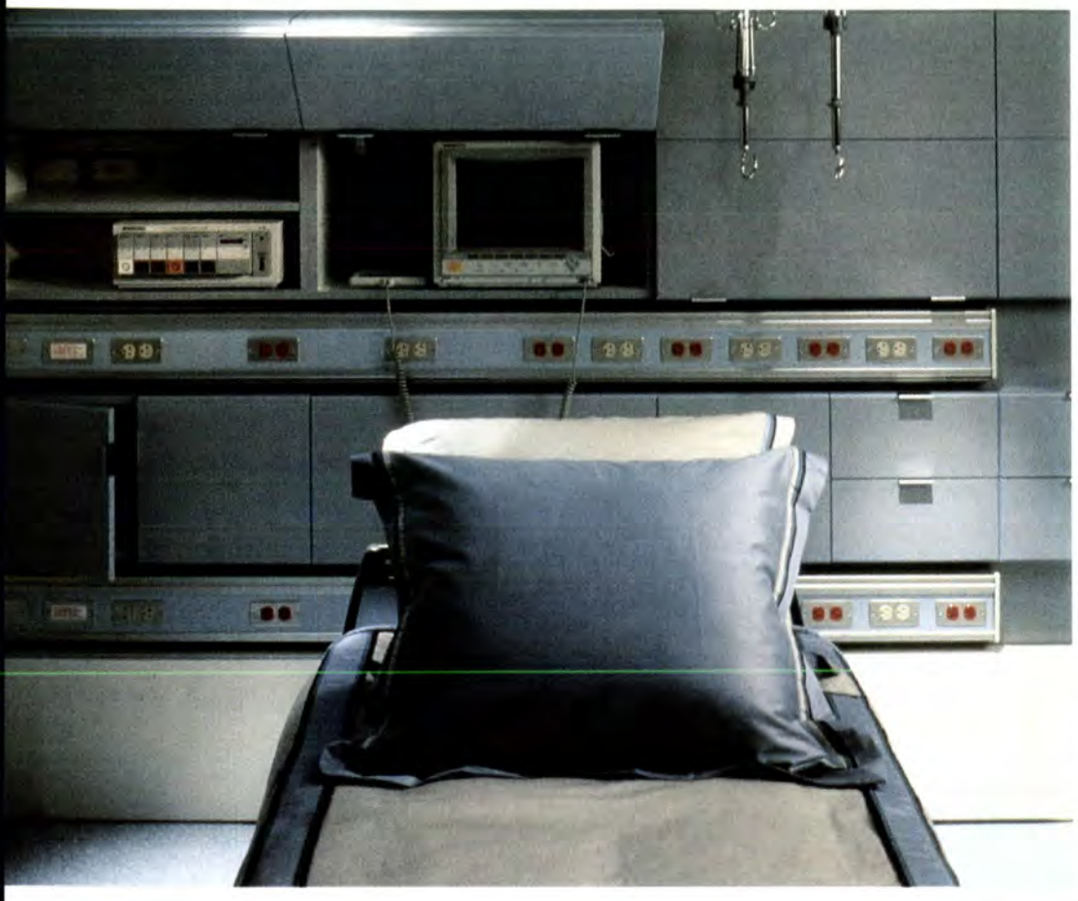
The Crown Hotel Plaza is a mixed-use complex with shopping plaza and parking at the podium level, roof gardens and a hotel rising above.

An existing four-storey building on the adjacent lot to the south-east and a very small frontage created a challenge for TSG: the design needed to attract people and draw them in to the hotel and shopping complex, set back some distance from the street front. The architect used the curve of an elliptical drum form and a gently curving wall to draw people into the site. Additional subtle persuasion comes from the open void created between two solid masses.

A curtain waterfall effectively screens off the rather unattractive four-storey neighbouring building. To contrast with the solid mass of the elliptical plaza element, the curved hotel wall is clad with curtain walling. This rising curved building makes a unique contribution to Jakarta's steadily developing skyline.


CROWN HOTEL PLAZA

Healthcare



The architecture of the feel-good factor

Hospitals and prisons have suffered from similar public prejudices. Within their institutional walls individuals are subjected to regimented regimes. Just as no sane person would volunteer to become a prison inmate, few of us relish the prospect of a stay in hospital, partly fearing the uncertain outcomes and potential distress of treatment, but equally because of the nature of the institution itself. Until recently architecture has remained firmly at the bottom of hospital adminstrators' priority lists. But the last couple of years has witnessed significant progress in this area, particularly in the USA and UK. Peter Wislocki examines these changes, and *World Architecture* looks at projects currently breaking the institutional mould.

The design of hospitals has responded to the prejudicial notions of healthcare in diverse ways. In the United States, where most of the developments in healthcare architecture were driven by a system in which individuals exercised the privileges of clients, choosing how and where their private insurance benefits were to be spent, personal comforts were an integral factor in the marketing of healthcare facilities. By contrast, in the majority of countries where direct public funding of healthcare has been the norm, Britain being a prime example, hospitals were expected to become ever more efficient machines, without commensurate improvements in the qualities of their environments. The efficiency of the resulting projects has been disputed; but what is certain is that they were of limited architectural interest.

Just in the last couple of years, the respective tides have turned. American healthcare services are rapidly seeking to provide better value for money, partly through more efficient architectural design and facility planning. Conversely, the rest of the world has come to realise that healing environments, and the satisfaction of patients' wider, non-clinical desires, are vital ingredients in successful healthcare provision. Firms like Anshen and Allen (to be profiled in *World Architecture 48*) exemplify the globalisation of the healthcare facilities market, having projects in, amongst other places, the USA, the UK, China and Turkey. The San Francisco-based firm not only designs buildings, but advises clients on strategic matters related to healthcare procurement, which increasingly covers a spectrum of strata from care in the home (potentially using IT to allow for diagnosis and primary treatment without the physical presence of medically qualified staff) to the most complex and specialised acute care centres.

Views to healing

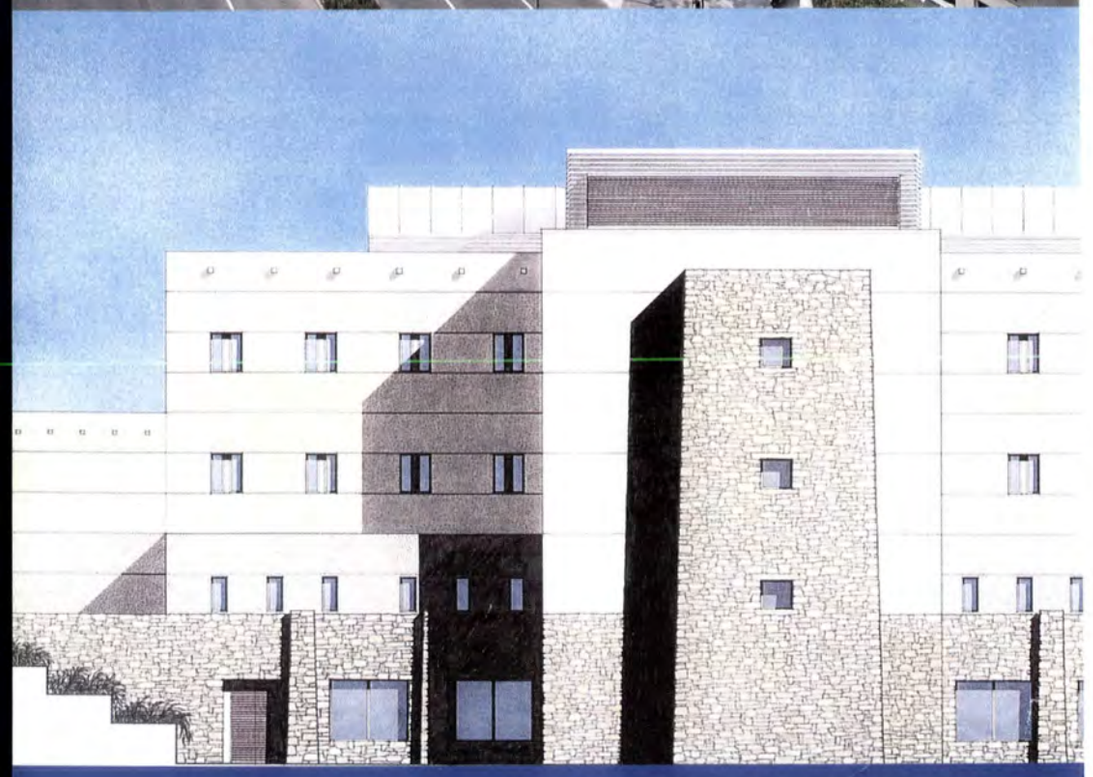
The emphasis on environmental quality which has characterised American hospitals over the last couple of decades can be traced back to the foundation of Rudolf Steiner's Anthroposophical Society in 1912. The idea that the environment can perform a healing function, by significantly reducing psychological stress, was revived in the 1970s, initially in obstetrics units. Whilst the idea of childbirth in a more "domestic" setting was relatively easily appropriated into the mainstream of medical practice, it

Opposite page *The ICU of the future, Anshen + Allen Architects.* ***Right from top*** *The Clinical Sciences Building, University College Galway, by Scott Tallon Walker which exploits a gentle fall in the site to give a main entrance at mid-level at the top of a large spiral entrance stairway. Harrison Memorial Hospital, Bremerton, Washington, by NBBJ, a three-storey renovation and addition project which seeks to unify the previously fragmented hospital campus. Exterior view of Clovis Community Hospital, Anshen + Allen Architects*

took a little longer for all new hospitals to respond to these consumer-inspired pressures. The best hospitals today allow the majority of patients the greatest possible degree of privacy and independence compatible with maintaining medical supervision. Individuals control the lighting, ventilation and temperature of the spaces they occupy. Personal belongings may be brought from home and patients may choose which of the hospital's collection of artworks is to be displayed next to their bed.

The patient-centred philosophy has strategic design implications – much greater than the use of bright colours and fragranced supplied air. Research carried out in 1984 by Roger Ullrich confirms that patients enjoying a pleasant view from their bed, recover more quickly – a view supported in the campaigns of Planetree, a San Francisco-based healthcare consumer organisation. Stimulation of all five senses is desirable. Music, theatre and comedy are provided for the enjoyment of all; whilst those seeking undisturbed contemplation are always allowed a space for this purpose.

Hospitals increasingly came to resemble luxury hotels, complete with extensive shopping facilities and entertainment. New medical facilities became bigger and grander. Until the bubble burst. Suddenly, American hospitals have become part of a policy of managed care. Under pressure from insurance companies, employers (who pay insurance premiums) and government, more efficient – better managed – strategies have been adopted. In architectural terms, this has dramatically cut the number of large, new-build projects, with an increased reliance on refurbishment of older facilities. Current designs reflect a move towards outpatient treatment – even for minor surgery – with a smaller proportion of traditional wards, reflecting the trend established in European policies decades ago. Buildings are becoming more compact, in an effort to reduce the distances travelled by patients and staff, again improving organisational efficiency. The dynamic state of the healthcare market is being recognised in more flexible, easily adaptable and extendible building designs. Architects with strong reputations in healthcare are expanding their design-build divisions – for example, Ellerbe Becket Construction Services, which markets itself on the basis of its specialist expertise,



Top to bottom *Exterior view of Katharinenhospital, Stuttgart, Germany, by Heile, Wischer und Partner. Detail of Sheppard Robson's elevation of King Saud University Teaching Hospital, a building that separates both patients and medical students by gender, whilst adapting to climatic conditions. Woodlands Nursing Home, London, UK, by Penroyre and Prasad which seeks to create a "home" rather than a "secure unit" for its elderly inhabitants*

fixed package prices and rapid construction programmes. But, as a proportion of total healthcare capital spending, design-build is still relatively insignificant.

Caring capitalism

Britain's introduction of an internal market within the public sector National Health Service provides an example of the underlying dynamics beginning to blur traditional transatlantic distinctions. As elsewhere in Europe, the strong role of central and regional governments in healthcare provision tended to encourage tangible and quantifiable progress in medical technology and management, sometimes to the detriment of the overall healing experience. Public servants, ultimately accountable to elected politicians and taxpayers, were reluctant to spend money on such intangibles as good architecture.

The split between purchasers and providers in the system has had a profound, generally liberating impact on hospital designers. Previously the Department of Health issued detailed guidelines on every aspect of design, which administrators in Regional Health Authorities followed. Whilst some centrally-driven initiatives were technologically innovative – such as the Nucleus model for the design of wards – their uniformity is no longer tolerable in a decentralised, market-orientated healthcare culture. Standardised templates were inappropriate to the wide range of functions they were expected to accommodate, and therefore frequently failed to meet even their core objective of efficiency. Hospital staff were consciously distanced from design decision making under the old regime, on the pretext of accelerating notoriously lengthy lead-in times.

Individual schemes have responded to changes in healthcare procurement. Non-core services, including pathology and pharmacology, as well as support functions like catering and laundry, are being subcontracted and carried out away from hospital campuses. Much of the ancillary accommodation traditionally required is therefore no longer specified. Above all, following the American lead, patients are increasingly being seen as consumers, able to exercise choice (through the intervention of their fund-holding physicians). Hospital designs are becoming more distinctive and environmentally stimulating.

Whilst private funding of capital projects

Hiroshi Shinozawa

Scott Frances

Left *St Luke's International Hospital Project, Tokyo, Japan by Nikken Sekkei a new-build project that perpetuates the institutions' 60 year-old US-orientated approach to healthcare.* ***Below*** *La Palestra , New York. HLW 's innovative interior refurbishment combines the disciplines of medicine and fitness in an existing urban site*

has long been the norm in the United States, its recent ascendancy in Europe has proved a mixed blessing. Contractor-led teams have incentives to innovate – for commercial, as well as philanthropic reasons. However, the use of developer competitions, in which alternative packages (incorporating designs within a financial proposal) are put together by rival consortia, has prevented hospital staff from being consulted in the early stages of design. Only once the winner is chosen are clinicians permitted direct, regular access to designers. The introduction of the Private Finance Initiative in the UK has also delayed a number of projects – although the backlog may soon clear.

Global trends and national distinctions

The bilateral comparison between British and US approaches to healthcare design and procurement provides a framework within which most other countries can be situated. For example, within Australia's current wave of state government-funded hospital building, leading designers are applying all of the patient-focused strategies found in recent US and British projects. The same can be said for Hong Kong, where public funding remains prevalent within a mixed economy healthcare system.

In the context of global healthcare architecture, a few projects stand out for their unique intentions. For example, Ahrens Burton and Koralek's St Mary's hospital on the Isle of Wight set a new standard in energy efficiency – 50 percent below the UK average in 1993. This has been marginally bettered by Powell and Moya's Ashington recent project in Newcastle which attempts a 60 percent energy saving.

Other projects reflect fundamental cultural differences. Sheppard Robson's design for a teaching hospital at the King Saud University in Abha, adapts to Saudi Arabia's climate, architectural traditions and, crucially, separates both patients and medical students according to gender. Nikken Sekkei's refurbishment of St Luke's International Hospital in Tokyo updates an institution which introduced the American patient-orientated approach to Japanese healthcare over 60 years ago.

With these exceptions, healthcare buildings – like the political and economic forces which shape them – are becoming more globally homogeneous, reflecting the universal human understanding of what constitutes a healing environment. **WA**

Healthcare facilities
Hanscomb Associates

Healthcare delivery varies across the globe. Hanscomb Associates indicate the trends in construction costs of international hospitals and healthcare facilities.

There are many complex technological and social issues that shape the nature of healthcare delivery. For most countries, political decisions ultimately determine or at least greatly influence the delivery system configuration. Government policies must continually address healthcare issues such as: cost containment, access, quality, and technological change. In the end, it is the delivery systems that can shape the facility types and functional requirements in any country's healthcare system.

Government policies, and their implementation in the built environment, can be quite different in each country. Finland and Sweden, which both offer state-funded healthcare, illustrate this idea. The Finnish government have been promoting primary healthcare since an act passed in 1972. The result is a greater emphasis on community based health centres, which offer a wide range of services – emergency care, psychiatric programmes, inpatient care, and educational programmes. However, Sweden has been slow to move from hospital care to healthcare centres. These government policies shape the functional requirements and types of healthcare facilities provided.

The US and UK provide another example of government influence showing opposite trends. It is somewhat ironic that the underlying reason in each country for the change is containment of rising healthcare costs. There is a movement in the US for greater government involvement in the healthcare delivery system. While significant changes in direct government involvement have not occurred yet, the possibility has begun to reshape the healthcare industry. In the UK, the government is encouraging private healthcare providers to provide facilities. There are a growing number of smaller private hospitals and some National Health Service hospitals are opting to become independent trusts. Both trends have major implications for designers in everything from marketing services to the types of facilities required.

Sociological changes can revise our view of healthcare. The aging population of many developed countries will place increasing demands upon the acute and intensive care bed spaces in hospitals. It also will spur construction in elderly care related facilities: nursing homes, assisted living facilities (with independent apartments), continuing care retirement communities. The goal is to provide a wide range of care options tailored to the level of care required. Lower care requirements equal lower healthcare costs, which will be critical as many governments face the increasing demands of elderly care.

Functional comparisons

Any time there is an attempt to compare facility costs internationally the issue of functional comparability must be considered. Regulatory requirements and cultural norms vary among countries effecting comparability. Some considerations specific to hospital requirements and functions include:

- Supply air changes required
- Emergency power requirements
- Typical layout of patient beds – wards, semi-private rooms, private rooms

Other comparability issues are common to all buildings, such as air-conditioning. In the US, it is standard not only in hospitals, but most buildings. In much of the world, it is typical for hospitals to have partial or no air-conditioning.

Many factors drive the functional requirements for hospitals, but the result is that there is no universal definition for them. For example, suppose you are trying to establish the costs for building a hospital in India. Someone has told you that hospitals cost US$325-425 per square metre, which is true. Knowing that hospitals in the US cost US$1,675-2,000 per square metre you find this difficult to believe. While both are hospitals, they are quite different in standard, function, scope, complexity and service. Tony Vallance of Hanscomb, San Francisco warns clients to "beware of a name, it's only a name and not a standard definition. In reality, a hospital built to US standards would be likely to cost US$1,500-1,900 per square metre in India".

A Future in Fragmentation?

What are the trends in healthcare and how might they effect construction costs? The very idea of a hospital is being redefined. A new hospital today would be difficult to compare with a hospital ten years ago. There has been, and continues to be, a fragmentation of functions. This is occurring on two levels:

- Functional areas are being detached from the hospital
- Functional areas are being split within the hospital

To simplify classification of healthcare space we will use the terms low-tech, medium-tech or hi-tech with space cost increasing from low- to hi-tech. This may not be very satisfactory without extensive definition (the label without a definition problem), but helpful for our current purposes. It is particularly useful for comparisons in the same country, since these space type ratios can vary between hospitals *(table 1)*.

The detachment of functional areas is a result of the shift to wellness/prevention based programmes. The detachment may not be physical, but often is. A growing emphasis on community and primary healthcare centres (ambulatory care centres) reflect this shift. This removes the urgent, but non-emergency care patients from hospital emergency rooms. The result is a better use of medical resources, reducing operating expenses. The product is more low-tech space, often removed from the acute care facility.

Stuart Ansley of Nix, Mann and Perkins in Atlanta, Georgia notes that healthcare providers prefer health promotion over treatment. Health providers in the US are providing fitness facilities and space for community outreach programmes, non-traditional space for hospitals. These are fee services, but health providers view these as a means of reducing

Table 1 – Square metre costs by space type

	US	Great Britain	Germany
Low-Tech space	$1,400-1,600	£650-755	DM 2,250-2,550
Medium-Tech space	$1,775-2,000	£825-975	DM 2,800-3,150
Hi-Tech space	$2,250-2,600	£1,100-1,275	DM 4,200-4,800

Likely General Hospital Costs

<US$1250/m2	US$1250-1750/m2	>US$1750/m2
Great Britain	Australia	Germany
Mexico	Belgium	Japan
Philippines	Canada	Netherlands
Portugal	Hong Kong	Switzerland
Spain	New Zealand	United States
Singapore	South Korea	

capital outlays for treatment facilities and staffing costs. The result is greater low-tech space requirements.

The growth of out-patient surgery shows this fragmentation. This shifts space requirements from hi-tech space to medium-tech space. A day surgery is less complex and overnight nursing is not required. New hospitals are likely to incorporate free-standing ambulatory or day surgery centres. Another trend in the US is shifting space to free-standing speciality clinics. Facilities specialising in obstetric care are an example. Typically, they are designed around the birthing concept where everything is in a single residential environment-type room. This replaces the typical hospital approach of labour room, delivery room, recovery room and post-natal.

The increasing use of home healthcare (visiting nursing) programmes exemplify the trend toward minimising hospital stays. In the US, home healthcare is increasing, which is adding to the amount of administrative low-tech space required. Some US hospitals are converting existing space to accommodate this rapidly growing programme.

With the shifting of functions from the hospital, space requirements are being redefined. Hospitals will become acute care centres. While current trends are lowering bed requirements, level of care requirements are increasing as physicians perform more procedures in out-patient facilities. The rapid change in diagnostic and treatment equipment over the past ten years has reshaped these areas, increasing their space needs. Hi-tech space as a percentage of total space in hospitals will increase. Many hospitals are converting patient wings, particularly areas that do not meet acute-care standards, to other uses such as diagnostic suites and home base for visiting nurses.

The decentralisation of functional areas is evident in areas remaining in the hospital. These are trends toward sub-nursing stations, bringing the nurse station function closer to the patient. Another trend is placing smaller x-ray suites in patient areas. We may even see the decentralisation of surgical suites to large patient floors.

We cannot overlook one important trend in healthcare design, the focus on "consumer" experience. The trend is to design facilities for the convenience of the patient, not the provider. The design of warmer, friendly healthcare environments are an example of increased customer awareness by providers. Perhaps the sub-nurses station is as much a response to this since it is the higher levels of acute care patients resulting from the increasing use of outpatient surgery.

Still, while there is a decentralisation trend, the large medical centre providing all services continues. It is simply being reshaped as a campus environment. We will see specialised outpatient facilities located around the inpatient acute care facility as well as remote.

Efforts to improve healthcare will continue to change health facilities, but the changes are not without cost implications, often increases. Generally, the "hospital" is becoming more technologically complex, as providers lift low-tech areas into free-standing facilities. The growth of outpatient surgery increases the level of acute care in hospitals. This also lowers the bed to surgery theatre ratio. Diagnostic areas in hospitals are increasing and often require very specialised space. Decentralising functions (ie sub-nurses stations) may provide better care, but not without minor increases in space requirements, which increases initial costs.

Flexibility and Change

Health facilities continue to face uncertainty due to changing modes of service and medical technology, which continues to place a design emphasis on flexibility and modularity. Designers continue to provide obvious solutions such as long spans to minimise columns and modular casework, but have introduced design innovations to improved flexibility. For example, the interstitial floor, which became popular in the 1970s, provided the ability to easily make changes to the mechanical and electrical systems. However, the fixed mechanical core paradigm may be replaced in the future. Since modularity allows interchangeability and easy reconfiguration, as technology enables components to be smaller and more modular future designs may emphasise modular, multiple HVAC systems for smaller zones.

The physical requirements of emerging technologies continue to demand flexibility in planning. Initial investment in health facilities is substantial, but operating costs dwarf these costs. The constant change experienced in healthcare facility requirements leave providers with important decisions on how best to provide these requirements. The basic question regarding the build – new or renovate existing – is which is less expensive? However, it is not the only issue. Issues such as accessibility, and community image may be equally important, just less quantifiable. Some of the economic issues that can be analysed include:

Remaining life of the facility. Hospitals typically are built to last, even in the US, and with some degree of flexibility to permit change. Still, every building has an economically useful life. Technological changes, such as those experienced by the healthcare industry, can reduce the economic life of even the best-planned facility. A realistic evaluation of facility age, code compliance, and adaptability to near term horizon technology must be considered.

Resulting space efficiencies. Operational costs are of critical importance. Improving clinical efficiency may be the primary factor in some renovations.

Disruption to service. Alterations must permit continued operation of primary functions. Most often this requires phasing of alterations, resulting in a premium for the construction.

Long term master plan vs. immediate requirements. In a more market-oriented climate, location becomes more important. Can the current property provide for long term space needs? If not, can adjacent property be acquired or should a new site be considered?

While there are no simple answers to this question, there are interesting current trends. The US trend is to renovate rather than build new facilities. The current trend in the UK is to build larger new regional hospitals, consolidating small older facilities. WA

Ontario Cancer Institute/ Princess Margaret Hospital

Toronto, Canada

Architects Zeidler-Roberts Partnership

Balthazar Korab K/HB

Founded in 1958, the Ontario Cancer Institute/Princess Margaret Hospital is recognised internationally for outstanding achievement in the treatment and research of cancer.

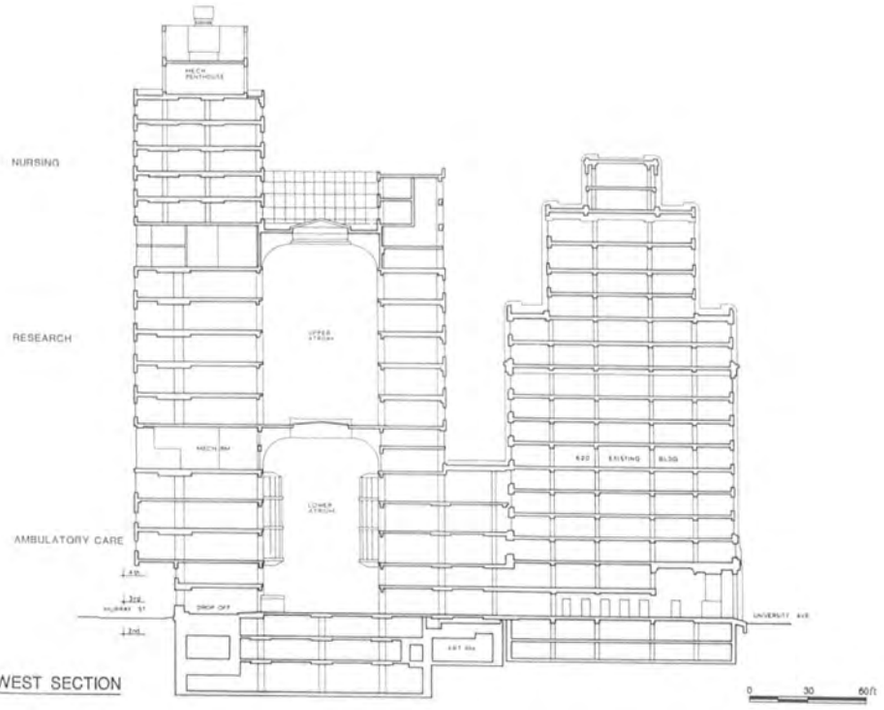
In July 1987 the Ontario Government announced its decision to locate the Princess Margaret Hospital on the site previously occupied by the 610 and 620 University Avenue buildings, in central Toronto. Bordered to the north by Orde Street, on the west by Murray Street, on the south by Mount Sinai Hospital, and on the east by University Avenue, the site was comprised of two buildings previously occupied by Ontario Hydro – an 18-storey 1930s office building and the facade of an earlier building.

The constrained urban site (61,400 square feet) combined with the required functional area (860,000 square feet) dictated a high-rise building solution. Furthermore, functional adjacencies with Mount Sinai Hospital had to be achieved as the two institutions share various facilities. For example, part of the radiation therapy department is located in the basement of Mount Sinai Hospital. A series of other complex site requirements relating to existing municipal services, such as public and private transportation to the site added to the complexity of the design mandate.

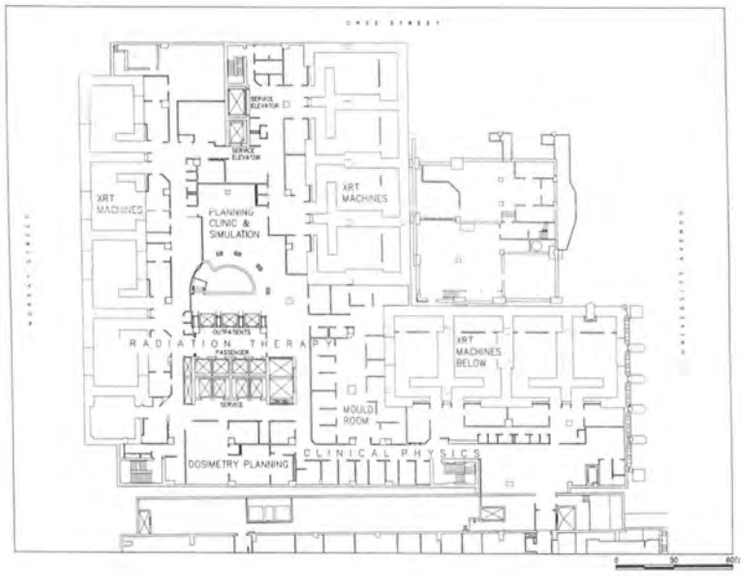
The hospital has been organised vertically around two stacked six-storey atriums and a roof garden, and is divided into four sectors on top of each other. Sector one comprised the first construction phase; located below ground – through the necessity of radiation shielding – the level 2 mega-voltage units, built within a concrete bunker are connected to Mount Sinai

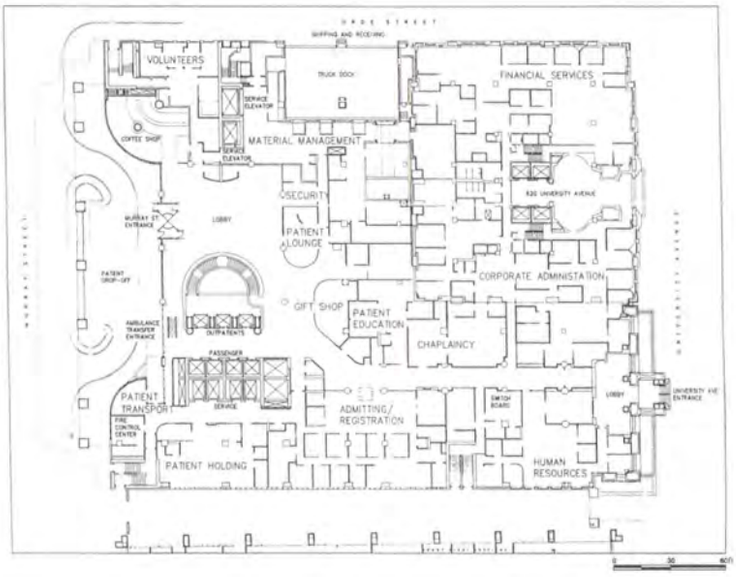
Left *View of Ontario Cancer Institute/Princess Margaret Hospital, on University Avenue, made up of two buildings previously occupied by Ontario Hydro.* ***Opposite page*** *Exterior view from Murray Street*

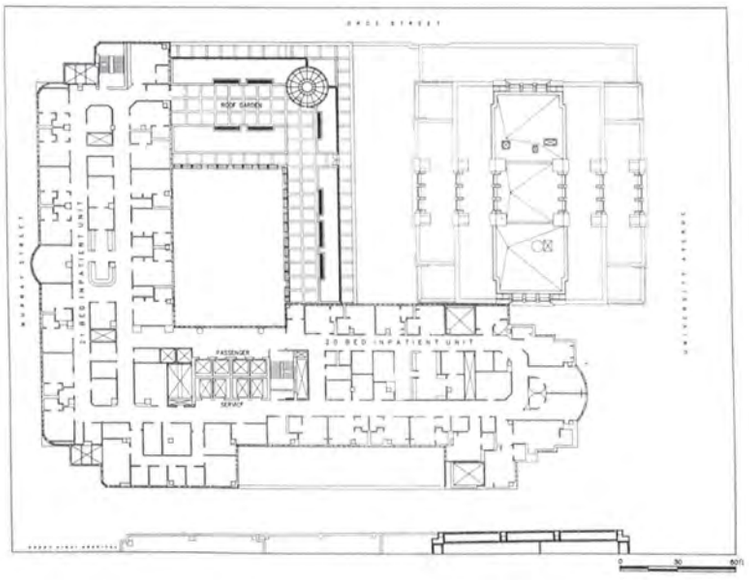
Left *East-west section of Ontario Cancer Institute/ Princess Margaret Hospital.* ***Below clockwise from top left*** *Plans of level 2, housing the radiation supply, below ground; Level 3 containing the principal outpatient services; Level 9 illustrating the layout of the research department, and; Level 17, with access to the roof garden*

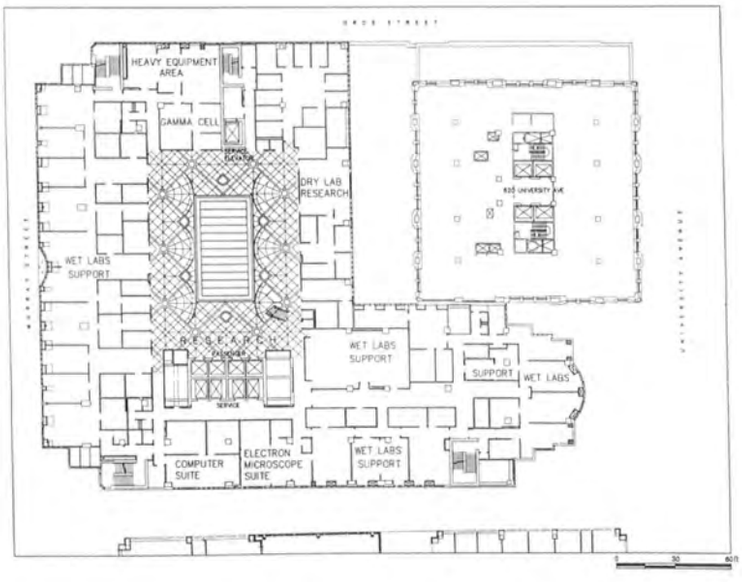


EAST-WEST SECTION









Balthazar Korab K/HB

Above *Interior view of 620 University Avenue. The banks of glass create a calming atmosphere for the benefit of patients.* ***Above right*** *Balconies are connected by stairways, at all levels, in order to create the atmosphere of a "research village".* ***Right*** *Lecture theatre in the research department*

Hospital. All material is distributed from this level throughout the hospital via the material handling elevator bank on the south side.

Sector two, levels three to seven, contains both the medical and outpatient services of the hospital, grouped around a five-storey interior atrium. 620 University Avenue – 1930s office building – is preserved in its totality, including the historic elevator lobby, which serves the upper office levels. Level three – street level – has entrances from University Avenue and Murray Street. Both connect to the vertical transportation core at the atrium. A bank of glass in-patient elevators serves levels two to eight. Patient-related services are close to the entrances with the clinical physics, radiotherapy and offices occupying the remainder of the floor.

Sector three contains the research department. The upper research atrium has balconies and open stairways connecting all levels to create the atmosphere of a "research village". Research is located between levels 9 to 13, with the highest level being used for animal facilities. The "donut" floor plan of this sector allows maximum daylight exposure for each research work station.

The second atrium comprises six storeys and has a landscaped interior, which provides a green area all year round. All levels of the research department are connected by open interior stairs in order to encourage scientific interchange between the various research departments. There are plans to construct a connecting bridge linking this research centre with the centre at the Mount Sinai Hospital.

Located on the five uppermost levels are the inpatient units, overlooking the roof garden and the university campus, creating a restful setting for patients. The lower two levels of sector four – levels 15 and 16 – have three internally connected nursing units, each accessible from the public elevator and the in-patient service elevator banks.

The principle behind the design was to create an efficient nursing unit layout with all the facilities related as closely as possible to the individual room, whilst at the same time avoiding the institutional feeling of long, imposing corridors so prevalent in traditional health care design. **WA**

Project	Ontario Cancer Institute/ Princess Margaret Hospital
Client/Owner	Ontario Cancer Institute/ Princess Margaret Hospital
Architect and Interior Designer	Zeidler Roberts Partnership
Structural Consultant	Quinn Dressel Associates
Mechanical & Electrical Consultant	The ECE Group Ltd
Landscape Architect	Baker Salmona Associates Ltd
Historic Buildings Consultant	Spencer R Higgins Architects
Acoustical Consultant	Valcoustics Canada Ltd
Code Consultant	Larden Muniak Consulting Inc.
Elevator Consultant	H H Angus & Associates Ltd
General Contractor	Ellis-Don Construction Ltd
Food Service Consultant	Cini Little International

Langkawi Hospital

Langkawi, Malaysia

Architects SCANN Consultants AB, of FFNS Gruppen, in association with LEK Akitek

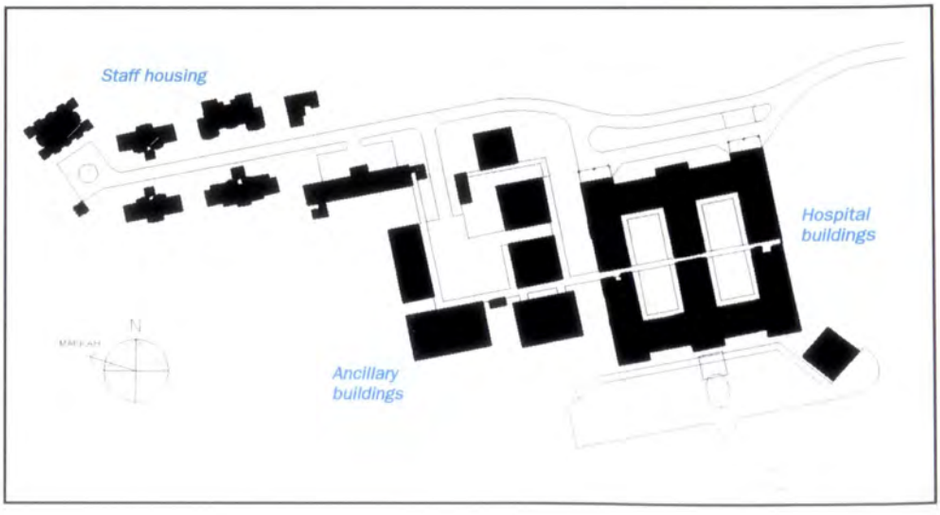
Designed by SCAAN Consultants (of FFNS Gruppen) and constructed on a turn-key basis by Swedish contractors SKANSKA, Langkawi Hospital – located on an island on the north west coast of Malaysia – was formally opened on 1 November 1995. Langkawi Island is being developed as a holiday resort, one million visitors are expected annually. The clients, the Malaysian Ministry of Health, required a modern hospital capable of serving both the visiting tourist population as well as the local population. The Ministry worked in close co-operation with the design team over the 18 months from design to completion.

The 16,000 square metre hospital has 110 beds – with potential for expansion to 250 beds – for internal medicine, surgery, paediatrics

Main picture *SCANN Consultants' AB (of the FFNS Group) Langkawi Hospital, view towards the main entrance of the hospital.* ***Below*** *One of the two courtyards of the hospital.* ***Bottom*** *Site layout defining the three principle elements of Langkawi Hospital*

and maternity. Inpatient services include intensive care, cardiac care and a special care nursery. The operating area comprises two theatres, which have been designed for day surgery. Outpatient facilities include an emergency unit, specialist clinics and a physiotherapy department.

Consisting of three principle elements; the hospital block, ancillary buildings and staff quarters, the hospital was planned on a 7.2 metre grid in order to create a uniform floor space between the columns. The cross-section was limited to 14.4 metres, offering good conditions for cross-ventilation and natural lighting. The buildings surround two large courtyards divided by a two-level passage. All departments have access from this



View of one of the hospitals' two courtyards, illustrating the value of the balconies in terms of both access and sun-shading

passage to the lifts and the main staircase. Facing the courtyard are broad balconies, which can be used for both communications purposes and as a secondary means of access to the departments, and individual rooms.

The hospital block is a three storey construction, and due to the uneven nature of the site there are entrances on several levels. Constructed around a central hall, the first floor houses the specialist departments – the imaging department, pharmacy, physiotherapy department and laboratory.

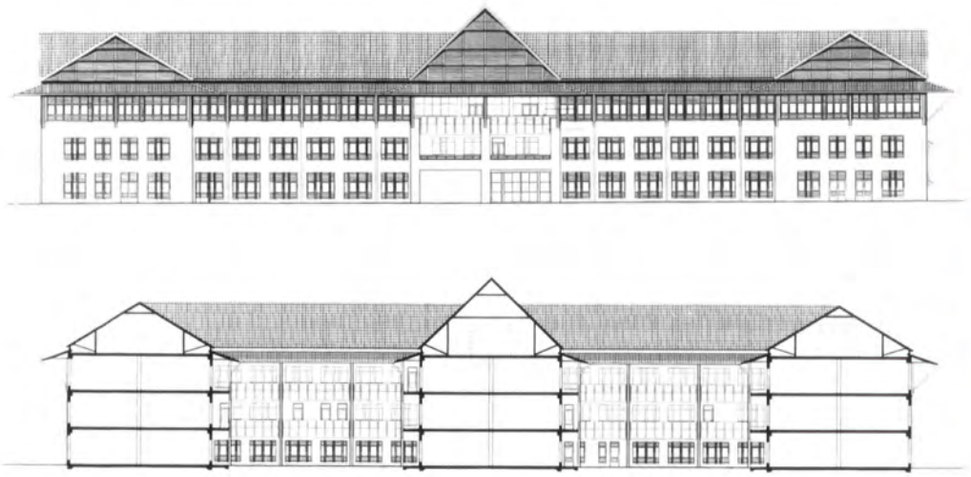
The central hall is open to the courtyards in order to harmonise the hospital with the natural habitat. The second floor houses the emergency department, the labour unit and operating theatres. The remaining wards are located on the third floor from where patients are afforded expansive views, cross-ventilation and good contact with the centrally located nurse station.

The external design, dictated by climatic conditions, is dominated by vernacular architectural elements, including the typical roofing structure and covered walkways. Added to this, flexibility in layout and window location, as well as differing arrangements of glass panels, louvres and cantilevered shading are all incorporated in a regular pattern of rectangular window openings. The layout seeks to combine the advantages of the narrow-building corridor system – scale, accessibility, lighting, cross-ventilation, rational construction – with the logistical advantages of a double corridor system, by means of the courtyard access balconies.

All columns and floor slabs are in-situ concrete. The roofs, even on the covered walkways, are covered in blue-glazed tiles. In order to achieve a high degree of natural ventilation lattice-work motifs are a feature around the windows. The extended cantilevered roof, sun screens and balconies ensure sun shading to most of the facade.

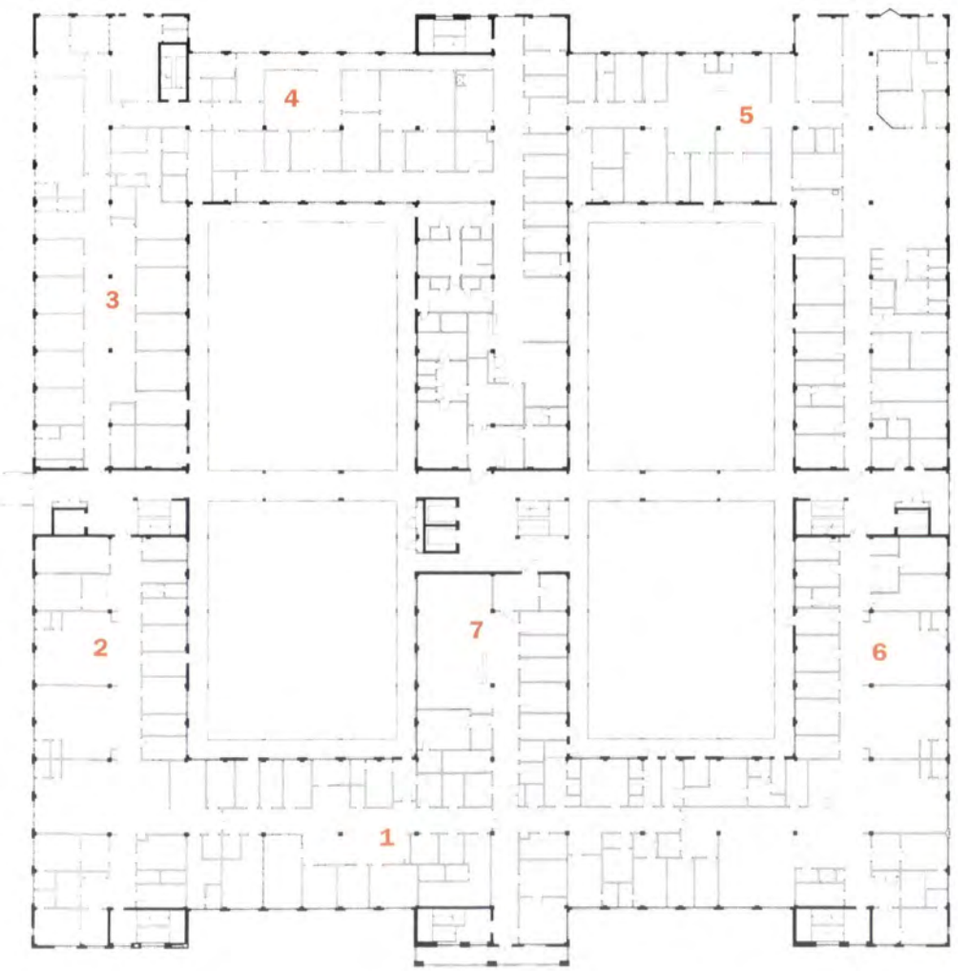
The floor and walls of the main hall are constructed of local marble. Furniture and equipment are a mixture of Swedish and Malaysian products. **WA**

Clockwise from top right *Entrance hall and reception area, with access to courtyard. Staircase from entrance lobby to second floor. Interior view of the second floor ICU and intensive care unit. Plan of first floor of the main hospital building. Langkawi Hospital cross section, and front elevation*



Key to first floor plan

1 *Special care nursery*
2 *Maternity beds 3rd class ward*
3 *Labour unit*
4 *Operation theatre unit*
5 *Accident and emergency department*
6 *Pediatric ward*
7 *Intensive care unit / Coronary care unit*



Project	Langkawi Hospital
Client	The Malaysian Ministry of Health
Architect	SCAAN Consultants AB of the FFNS Group (Sweden), in association with LEK Akitek (Malaysia)
Turn-key Contractor	SKANSKA International Building AB (SKANSKA Pamara JV) (Sweden)
Civil/Structural Engineer	SKANSKA Teknik AB (Sweden)
M & E Engineer	Perunding Hashim & Neh Sdn, Bhd (Malaysia)

Northside Hospital Emergency Department expansion and relocation

Atlanta, Georgia

Architects NBBJ
Photographs Kevin Ames/Atlanta Photography

Northside's original emergency room was typical of its period in design and function. It was designed for acute care and occasional trauma, but was not prominent in the functional planning of the hospital. Over the years various additions had been made to the existing facility – notably a parking garage – which had partially obscured the entrance to the emergency department. Coupled with the need to improve customer satisfaction, and the fact that the existing plant had reached its capacity – an analysis showed that 50 percent of the hospital's daily admissions went through the emergency department – NBBJ's design team defined their re-design objectives as easy access, user satisfaction, operational efficiency, and a distinctive image. In addressing the issue of access it was decided that a move to a new location was the only viable option, despite added costs and displaced parking.

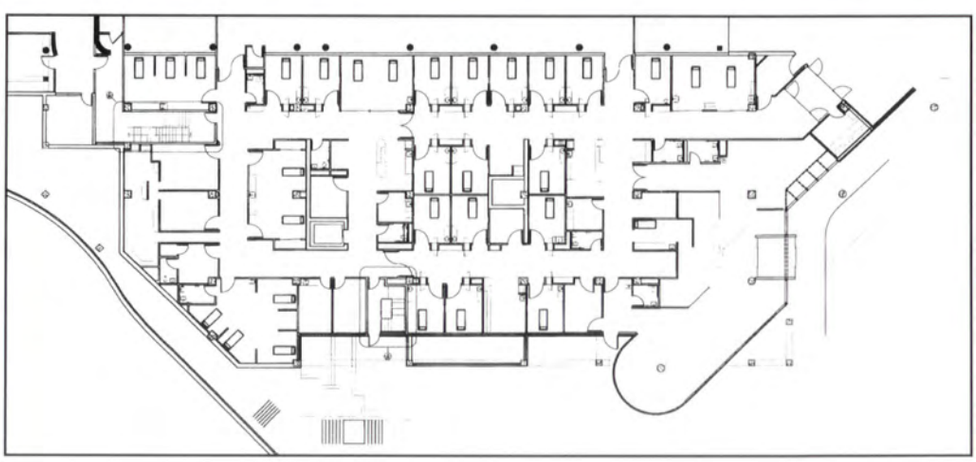
User satisfaction was necessary for multiple groups of people including patients, physicians, staff and vendors. At the time of construction Northside Hospital, as an institution, was embracing "Patient Focused Care" as a key element in an overall strategy to solidify its position in the Atlanta market. The Emergency Department became prominent in this plan. The impacts on the design were notable: patients were to be treated by "care teams", which required multiple decentralised work areas. Treatment rooms became universal in function in order to minimise unnecessary transportation of patients.

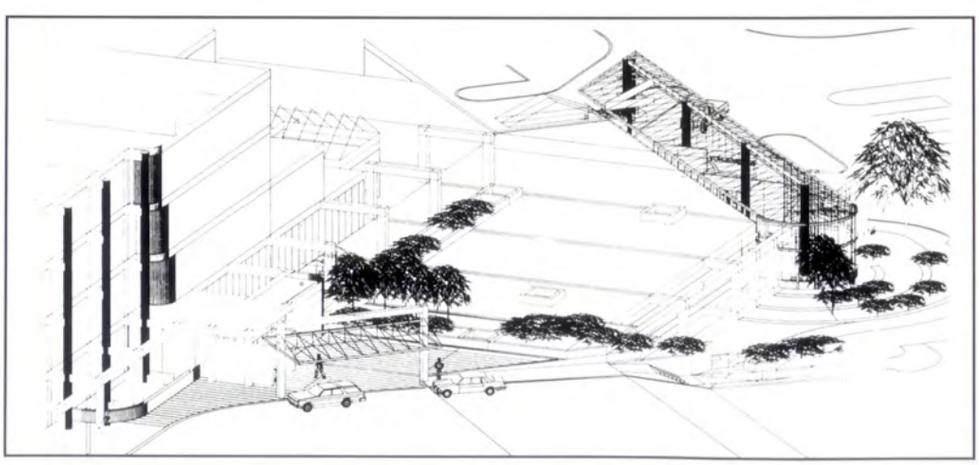
On arrival, patients are shown directly to a treatment room necessitating the sensitive design of waiting rooms for relatives. Service providers, such as ambulance drivers and outside physicians are comfortably accommodated to encourage their use of their facility. Patients are treated according to the gravity of their complaint in order to lessen the stress inside the clinical areas of the department, which also effects operations in a manner examined below.

Operational efficiency was an essential component of the redesign. The segregation of patients by the severity of the ailment enabled the staff to reduce the time spent in a room, thereby increasing capacity for the same square footage of space. In the managed-care environment, operational efficiency translates directly to the bottom line.

The image of the facility needed to address the preceding elements as well as being a distinguished addition to the campus. Natural light was used as an orientating device, with skylights providing clues as to location and destination. The interiors were developed along a professional motif in place of an institutional look, and at night the building has been designed to symbolise a welcoming "lantern". WA

Opposite page top *Natural light was used as a design element in Northside Hospital Emergency Department, to facilitate orientation and foster a calming atmosphere.* ***Opposite page bottom*** *Decentralised care team stations bring staff work areas closer to the patients.* ***Above*** *The distinctive colour and form of the entrance meet a re-design objective of the NBBJ design team.* ***Right*** *Ground floor plan of Northside Hospital Emergency Department.* ***Below right*** *Three-dimensional plan illustrating accessibility*



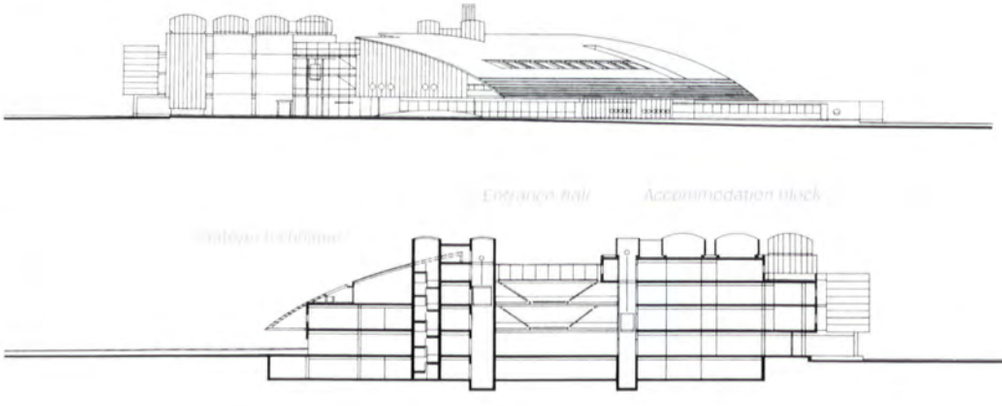


Project	Northside Hospital Emergency Department Expansion and Relocation
Client	Northside Hospital
Architect	NBBJ - Columbus, Ohio
Associate Architect	Howell Rusk Dodson Architects
Mechanical Engineers	Newcomb & Boyd
Electrical Engineers	Hibble, Peters & Dawson
Structural Engineers	Sedki & Russ
Civil Engineer	W L Jordan

Montreuil Hospital

Montreuil-sur-Mer, France

Architects Groupe 6

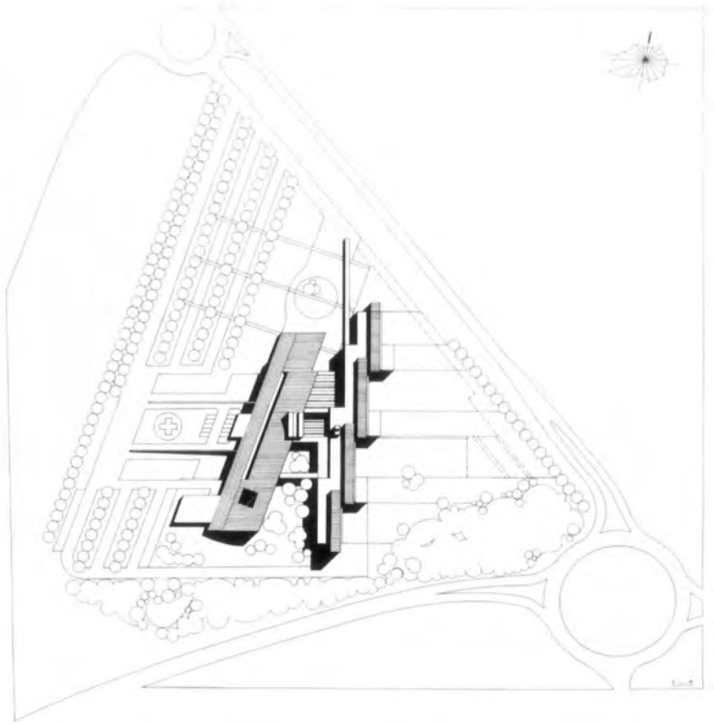


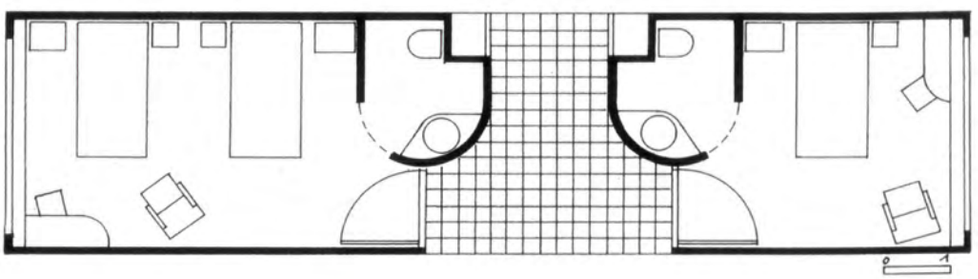
A reorganisation of healthcare provision in Pas de Calais was under consideration in 1990. The Préfet of the Department approved the findings of this study in October 1991. The study proposed that the District General Hospitals of Montreuil-sur-Mer and Berck should merge and that a new hospital of 17,700 square metres gross – providing 207 beds, operating theatres, radiography, laboratory, accident, emergency and outpatient departments with the necessary administrative facilities – should be built. The two hospitals merged in February 1993.

Located on an exposed escarpment overlooking a coastal plain eight kilometres from the sea, the site is easily accessible from the new Autoroute A16.

The exposed location of the site played a significant role in the architectural decisions taken by the design team. In order to make the building aerodynamic, the architects have taken account of the fact that the strongest winds come from the west and east. The design response was to create a sheltered entrance court to the north and a protected garden to the south. These two spaces are defined by the wing-like volume of the inclined zinc "plateau technique" roof to the west and the staggered volumes of the residential wards to the east.

The main entrance leads directly from the protected courtyard at the northern end of the site. This provides a focus for the hospital, housing the reception, admissions and waiting areas, shops and lifts for the public. By placing the two volumes at an angle to each other it was possible to create an inviting entrance, opening the southern garden to the sun to bring light and greenery into the heart of the hospital. The medical and caring functions of the hospital are separated, each being housed in the clearly expressed volumes of the "wing" and the accommodation block. Each volume





Opposite page main picture *View of the main entrance of Montreuil Hospital, illustrating the "plateau technique" which protects the inner courtyard from harsh westerly winds.* ***Opposite page below*** *West elevation and east-west section.* ***Top left*** *Ground floor plan.* ***Top right*** *Site plan, the access road is on the far left, leading from the Autoroute A16.* ***Right*** *Standard one and two bed rooms.* ***Below right*** *View of the hospital from the east, indicating the placement of the two major volumes at an angle to each other*

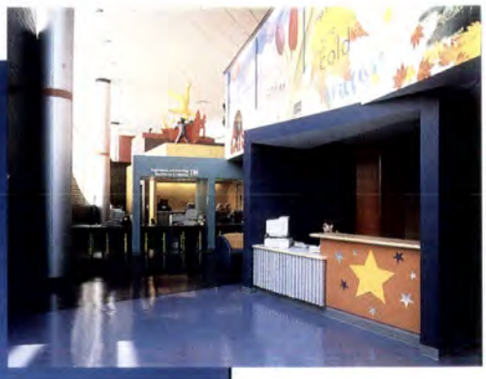
has its own lifts which are located around the main entrance hall, thus reinforcing the role of the hall as a focus for the hospital. Open bridges cross the hall linking the two volumes at every level.

Each individual room has its own bathroom, large enough for a wheel chair, with a curved form. The 7.40 metre grid ensures that the rooms are spacious – essential for flexibility and the easy movement of beds. All rooms have fully glazed external walls.

The "wing" is a vaulted structure of laminated beams clad in zinc with up-stand joints. Zinc was chosen for its ability to withstand the harsh microclimate of the Pas de Calais. The zinc is replaced by a galvanised steel *brise-soleil* where the vault nears the ground, this allows light to reach the western facade of the "wing" but protects it from glare and over-heating in summer. All plant and ducting is housed in the volume of the vault apart from three stainless steel chimneys. The entrance hall, rooflight and bridges are of light-weight material to ensure an airy atmosphere, flooded with natural light. The floor is finished with marble tiles.

The eastern facade of the accommodation wing is the view that is prominent from the approach road. As a result it is broken into four separate volumes which are staggered and have vaulted roofs. Clad in zinc, naturally tinted aluminium and glass, there is a play of light and shadow, greys and blues, of one volume against another which is both dynamic and reassuring, clearly a principle design requirement in any healthcare building. **WA**

Project	Montreuil Hospital
Client	Centre Hospitalier de l'Arrondissement de Montreuil-sur-Mer
Architect	Groupe 6
Bureau d'Etudes	CDF Ingenierie
Quantity Surveyors/ Construction Manager	Fougerolle/Thelu
Main Contractor	Thelu
Heating and Ventilation	Seitha
Medical gas and Plumbing	Dolbeau-Cegelec
Electrical Installation	Entreprise Industrielle



Robert Benson

Robert Benson

Left *From the left: the half cylinder configuration of the hospital's patient care tower, the geodesic sphere identifying the main entrance and the diagnostic treatment services in the rectangular unit to the right.* ***Above*** *Interior echos the bright colours and distinctive patterns of the facade avoiding an institutional atmosphere.*
Below *Ground floor plan*

Connecticut Children's Hospital

Hartford, Connecticut

Architects HKS

This project is the result of a merger of three children's hospitals – Newington Children's Hospital, Hartford Hospital and University of Connecticut's John Dempsey Hospital – into a new 138-bed, 290,000 square feet facility located on an urban site of 3.5 acres within the Hartford Hospital Campus in Hartford, Connecticut.

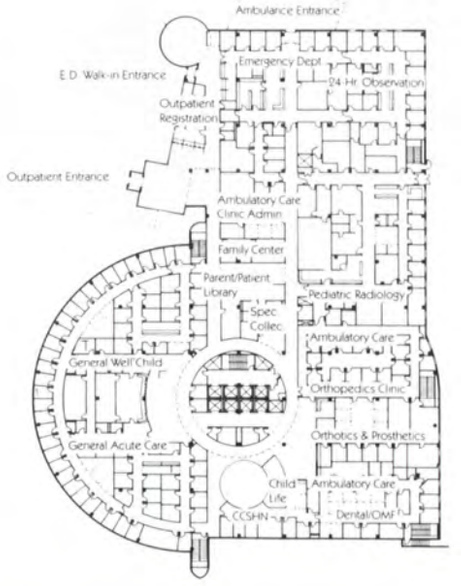
The new hospital reflects all significant trends in children's healthcare facilities including an emphasis on ambulatory outpatient care, the development of a friendly, relaxed environment, maximum staff efficiency and the provision of a design that will facilitate future growth and expansion. Allowances had to be made for the limited site area, the fact that the site slopes 15 feet from one side to the other, and the need to provide both bridge and tunnel connections to Hartford Hospital. Multiple entrances were needed – the main formal entrance, ambulatory, emergency and service entrances – as well as retaining access from the boulevard to Hartford Hospital. Finally, and perhaps most importantly, it was necessary for the new facility to have a prominent profile against the Washington Avenue elevation and Hartford Hospital.

The new hospital is comprised of four major building blocks: diagnostic and treatment services and ambulatory clinics; patient care services; elevator tower and mechanical interstitial mezzanine.

The patient care tower is a half cylinder configuration reflecting the functional consideration of minimising walking distance from the elevator core. The patient unit fans out from the elevators. This functional goal determined the half drum shape. A second patient care tower is planned to fan out in the opposite direction, in the future.

The diagnostic and treatment services – including the ambulatory clinics – are provided in a simple rectangular base of four floors. The elevator tower penetrates this base at a false angle, emphasising the core of the building. The patient-care tower connects to the elevator core but is separated by an undulating floor. The bay windows on the patient care tower provide texture and a play of light on the otherwise smooth reflective surface of the cylinder.

Overscaled geometric icons mark the principle entrances to the building. The geodesic sphere identifies the main entry, the cube represents the ambulatory care entrance and the eccentric cove signifies the walk-in emergency entrance. The bright colours and distinctive patterns of the facade aim to avoid a typical institutional hospital and appeal to children. **WA**



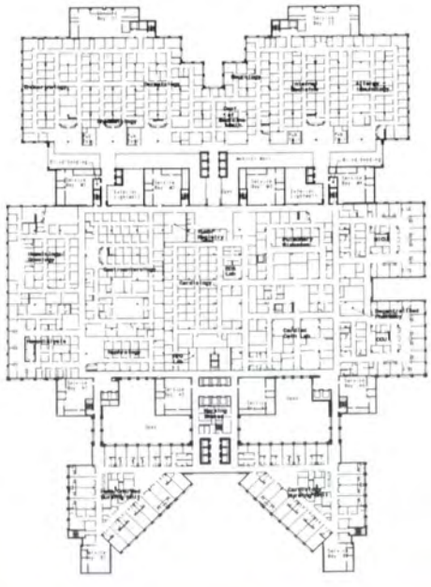
Project	Connecticut Children's Hospital
Client	Connecticut Health Systems Inc
Architect	HKS
Associate Architect	Russel Gibson von Dohlen
Programme Manager	Quorum Health Resources Inc
Interiors	The Hillier Group
Associate Interior Designer	Karlsberger & Associates
Contractor	The Robins & Morton Corporation
MEP	Smith Seckman Reid Inc

Below from left to right *The 1,480 000 square foot teaching hospital with the bed tower on the left, ancillary building in the centre and clinic building on the right; facade of nursing tower; interior showing three storey medical mall connecting the various clinics.* ***Bottom*** *Section through bed tower, ancillary building and clinic building (from left to right). Third floor plan*

Brooke Army Medical Center

San Antonio, Texas

Architects HKS



Brooke Army Medical Center is a giant 1,480,000 square foot teaching hospital complex consisting of three major components: a seven storey, 450-bed tower; a five storey ancillary building containing diagnostic treatment and building services; and a three storey clinic facility designed to support one million outpatient visits annually. The complex contains a complete range of inpatient treatment services (rehabilitation; intensive care; coronary and other critical units) as well as housing the Institute of Surgical Research (ISR), and a burns centre.

The nursing tower features a pair of triangular nursing units joined by a central service core containing vertical transportation and shared support functions. The main entrance to the hospital opens directly into the central core. A walkway connection extends from the ancillary building along with the first floor of the nursing tower and on the adjacent research laboratory building.

The clinic building consists of a series of speciality clinic modules with the main outpatient entrance dividing the first floor into two equal parts. The facility is zoned horizontally to locate medical activities within each element on the same floor level to the maximum extent. The ISR is a new 130,000 square foot stand-alone research laboratory developed as an adjunct to Brooke Army Medical Center. The three-storey building consists of separate research laboratories for the ISR and Clinical Investigation. Shared facilities include a full range of animal housing, logistical facilities, imaging and pathology. The project is designed to meet accreditation criteria of the college of American Pathologists (CAP) and the American Association for Accreditation of Laboratory Animal Care (AAALAC).

The mission of the ISR is to provide care for critically burned patients and conduct medical research to investigate burn treatment and causes of complications due to burns. This research is done in the context of combat casualty care. This "Army Burn Center" is the only treatment and research centre in the world.

The ISR – consisting of three divisions; clinical, laboratory and support – and clinical investigation department have separate and distinct entrances from the exterior. Adjacent to the main entrance is the ISR lobby which is flanked by the conference/classrooms on the east and the ISR administration reception area to the west. The conference/classrooms can be divided by means of a moveable partition and are served by a projection booth that can be used on both sides of the partition. WA

Project	Brooke Army Medical Center
Client	US Army Corp of Engineers
Architect	HKS with Wingler & Sharp Architects
Design and Construction Agent	US Army Corp of Engineers
Interiors	HKS Designcare
Contractor	Hyman/Manhatten
MEP	Goetting and Associate

Keiyu Hospital

Yokohama-shi, Kanagawa, Japan

Architects K Ito Architects & Engineers

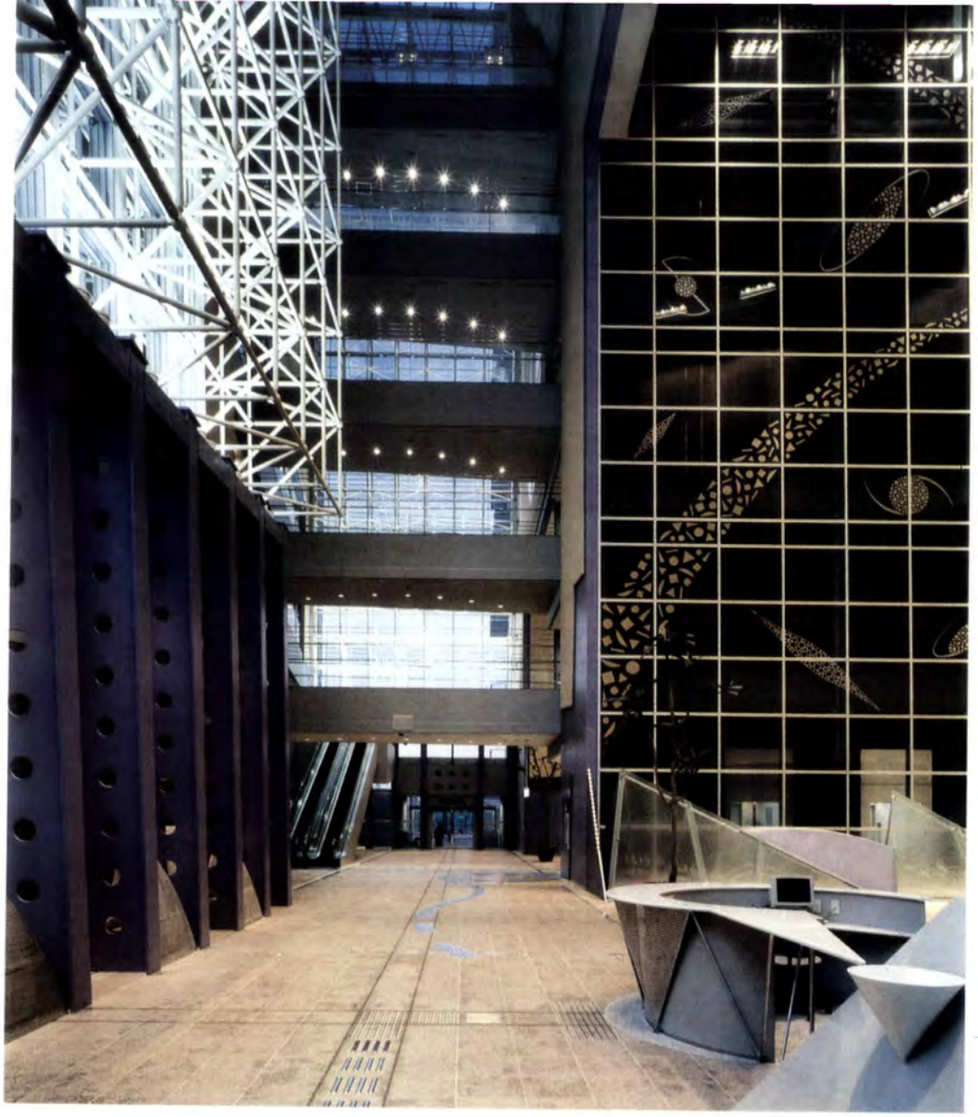
Yokohama – Japan's second largest east-coast city, after Tokyo – is historically recognised for its international outlook and open-door policy to overseas influences. Currently undergoing major redevelopment, with the intention of recreating Yokohama as a twenty-first century urban centre, the city has attracted a great deal of international interest. Keiyu Hospital is an element of this redevelopment process.

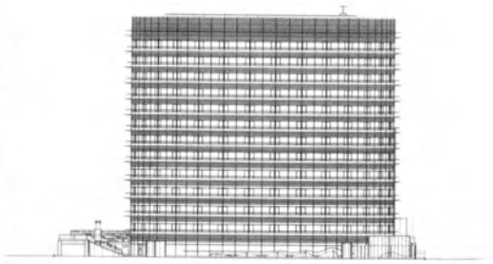
In approaching the design of the hospital, K Ito Architects and Engineers established three principal themes: "amenity", "hospitality" and "internationality". During the planning stage Keiyu Hospital was thought of as a "Hospital Resort", combining high level medical treatment with a sense of the hotel resort. Therefore, large open spaces and numerous amenities are to be found throughout the 13 storey steel and concrete structure. There are another three storeys below ground.

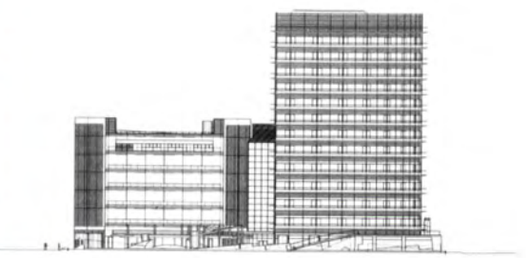
The atrium, central waiting room and day room were designed as recreational devices, allowing maximum use of open space to avoid the tension and intensity of the traditional medical institution. The atrium, located between the ward area and the examination section, was intended as the focal point of the whole hospital. However, this created the problem of there being no direct access from the examination section to the ward area. The design solution was to provide bridges over the atrium, linking the two areas.

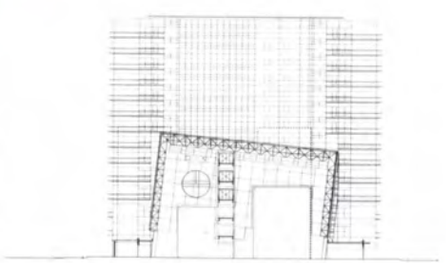
A further addition to the design objective of "hospitality" was the use of a way-finding system, in order to present the images of a simple, user-friendly and efficient hospital, and also to introduce the innovative notion of "healing art" into the corridors, waiting areas and the patients rooms.

A computerised reservation system was planned, in order for the hospital to provide a prompt service, and to avoid long and potentially uncomfortable waiting periods for patients. The designers also hoped that it would be possible to provide a variety of relaxing and informal areas for communication between patients and staff, amongst patients or amongst staff members. These areas include the day rooms, the roof garden, the cafeteria and the bridge over the









Opposite page *Main building showing both halves of the complex, joined by an atrium.* ***Photographs clockwise from the top*** *Entrance hall showing glass wall of atrium. Public seating area designed to create the atmosphere of a "resort hospital". One of the many waiting areas in the hospital.* ***Drawings from top*** *Roadside elevation. Elevation of main 13-storey building. Park elevation. Front elevation. Section showing detail of the atrium at the join of the two buildings*

atrium. Again the intention was to avoid the oppressive atmosphere of the typically enclosed hospital space.

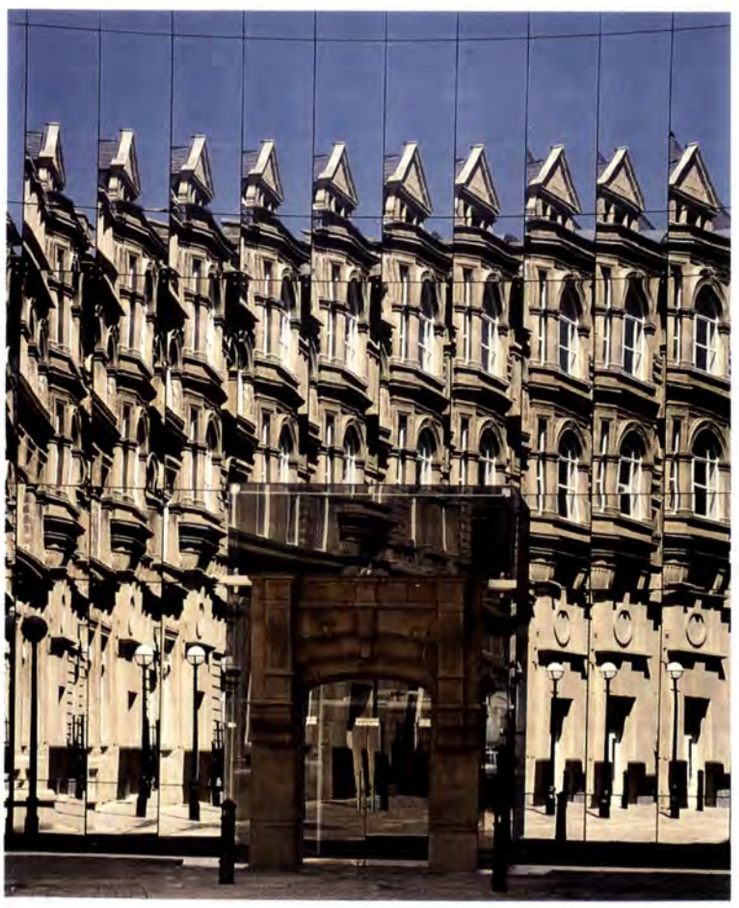
In keeping with the plan to re-create Yokohama as an international city of the twenty-first century, with amenities to match, the third of the design objectives, "internationality" was an important issue. Historically, signs in Japanese hospitals are written exclusively in Japanese, making them accessible only to the local population. However, at Keiyu Hospital signs are in both Japanese and English.

Keiyu Hospital can house 351 patients at any one time, and is capable of coping effectively with between 1200-1500 visitors. Approximately 7,000 square metres of parking space is available on the 8,000 metre site. **WA**

Project	Keiyu Hospital
Client	The Kangawa Keiyukai Foundation
Architect	K Ito Architects & Engineers
Sturctural Designer	Takumi Olmoto Constructions
Signage	Nomura Pop Images
Lighting	EPK
Sanitation	Daidan/Kawamoto/Nichihou - joint venture

The Art of Glass

Timothy Ostler follows the progress of curtain walling and structural glazing from London's nineteenth-century Crystal Palace, to Mies van der Rohe's 1919 glass skyscraper, Sir Norman Foster's Willis Faber Dumas building in Ipswich and IM Pei's Louvre Pyramid in Paris. In the 1990s structural glazing has become a by-word for striking contemporary design. *World Architecture* takes a look at the suppliers and consultants who rule the roost.



"My neighbours think I'm a double glazing salesman." These are the words of one of Britain's foremost cladding and curtain wall experts, and veteran of many of its most celebrated recent triumphs. His neighbours' confusion is understandable: after all, what does the non-architect know of curtain walling? For one thing its very name, and that of its close relation structural glazing, is a contradiction in terms. What kind of a wall is it that hangs like a curtain (and from what?). And how can you use glass structurally (everyone knows how easy it is to break)? For most architects, however, these two esoteric concepts hold a positive fascination. We long to be free of the weighty substance that holds our buildings up, either by hiding it behind a diaphanous shimmering veil, or by disposing of it altogether, exploiting modern glass' paradoxical combination of transparency and strength. Fortunately, the means are now widely available for this dream to come true – so much so, in fact, that we can now be pretty sure that this will be looked back on as the essential architectural style of the 1990s.

For this dream we can thank Joseph Paxton, who with his Crystal Palace managed to re-classify the greenhouse as *bona fide* architecture and thereby, eventually, seduce an entire profession. Combine that with Mies van der Rohe's curvy glass skyscraper of 1919 and you have the recipe for the current obsession. The details would have to be worked out over the next sixty years: Mies himself did little to advance the cause (he seems to have repented of his lapse into expressionism, to judge by the rectangular penance in which he spent the rest of his working life). So although Mies himself was the foremost exponent of the "curtain wall", in most cases the effect, embellished vertically with decorative steel mullions, was less that of a billowing, flexible curtain as we commonly understand it than of a theatre safety curtain, stiffened with railway lines.

This version of Mies' concept became established and, with variations, became as much the official uniform of 1960s corporate America as the white nylon shirt. Although the style of curtain walling changed, the principle was established, and not for the first time a concept originating in the minds. of modernist architects took on a life of its own when adopted and commercialised by industry. Approaches vary. While some manufacturers like Gärtner specialise in producing systems that are custom-adapted for each new project, others like Schüco offer standardised systems that combine sophisticated detailing with the convenience of a universal kit of parts. Their new FW75 system consists of complete factory-made floor-to-floor elements up to five metres wide, for which they claim installation rates of up to 300 square metres a day.

The prospect of widespread use of standardised curtain walling systems alarms some in the industry, who point out that with the exception of one-off prestige projects, architects will eventually be forced to use the same details, with the same optimum panel sizes. The result: uniformity.

Schüco are very keen to get across the fact that although their system could be described as a kind of Meccano for curtain walling, its diversity allows architects complete design freedom without the expense of having components custom-made.

Meanwhile it was not until Foster's Willis Faber Dumas building in Ipswich, UK, in the 1970s that anyone came up with the detailing and curvilinear lines to match Mies' idea. The means used to achieve this end were something called a suspended glass assembly, a technique developed by Pilkingtons for shop fronts which involved clamping together large expanses of toughened glass with patch plates at pane corners, sealing them with silicone mastic and suspending them vertically – thus exploiting the greater stability of glass in tension than in contraction.

Although it was not Foster's first use of suspended glass, Willis Faber was

Opposite *The Bourse, Leeds, UK completed in 1993 by the Fletcher Jones Partnership using Pilkington's "Planar system".* ***Top to bottom*** *Architects Feilden and Mawson used Glostal's 313 curtain walling system in their £23 million Press Centre for Eastern Counties Newspaper in Norwich, 1995; Pilkington's suspended assembly used in WZMH Group & Jung/Brannen & Associates' 53 State Street, Boston, USA 1985-86. Schüco's SG50N structural glazed system used by Studio AISA Architetto Giuliano Pastro in 1992 on the Alessi headquarters building in Italy*

quite revolutionary in its effect. It represented the birth of modern structural glazing: for the first time it was clear that an entire building might be wrapped in a seductive diaphanous veil.

The problem with suspended glass was that it was relatively inflexible. By definition it could only be hung, while the clamping forces that had to be achieved on site were substantial. Furthermore, it could not be used for installations more than 20 metres high and could not accommodate double glazing.

The solution became clear to Pilkington's engineers when they noticed the flush-finished counter-sunk bolts being used to assemble glass walls in squash courts. They realised that by using this technique they need no longer rely on friction to hang the glass but could instead simple bolt it back to the supporting structure. In this way it becomes a flush cladding panel, with no inherent height limits. So began Pilkington's Planar system, later developed in association with Ove Arup & Partners.

The first installation of Planar, using grey glass, took place at Farnborough Shopping Centre in the UK in 1982. The product was an instant success: architects not only admired its elegant fixing system, they realised that here was another major advance in the quest for the all-glass building. Although initially it might have seemed a step backwards because it was conventionally bolted to a steel structure, one of its beauties was that it could be bolted to anything, including glass fins.

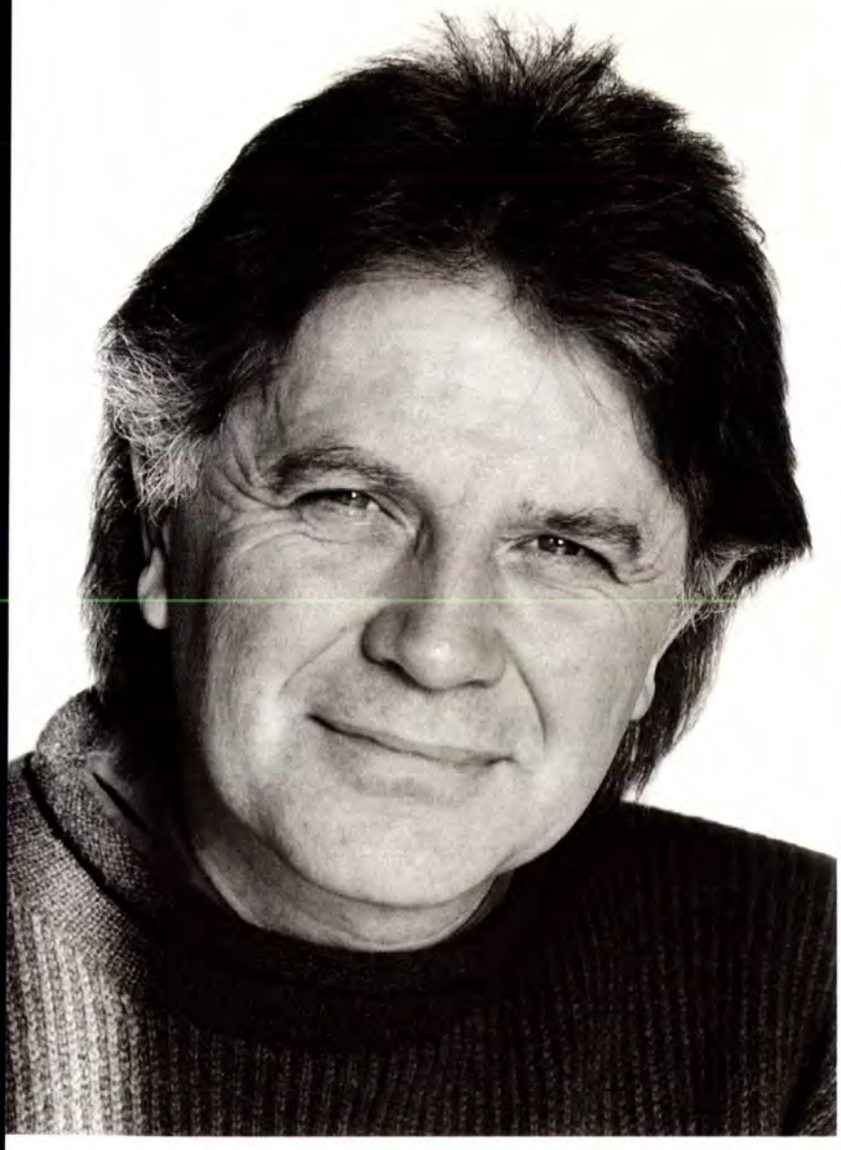
Moreover the bolt connections themselves began to be refined to resemble delicate stainless steel jewellery. By the late 1980s insights gained by leading architects during their weekend yachting expeditions were making themselves felt on structural glazing, with the first applications of stainless steel cable-stayed Planar. One of the main beneficiaries of this trend were yacht rigging manufacturers. For one of them, Norseman Gibb, architectural work now accounts for a major segment of its market.

Now that the use of structural glazing for vertical surfaces is well established, it is fanning out across other parts of the building. The process has been accelerated by the availability of engineering software capable of handling the calculations (in this sense the spread of structural glazing is yet another manifestation of advances in information technology). Roofs and floors are a major new area of application. The effect continues to drive technological development: whereas a vertical glass surface is unlikely to behave catastrophically when cracked, a horizontal surface will need to be in laminated toughened glass and glass beams may need to be doubled up as a back-up.

Thanks to the UK's famous obsession with detail refinement, many of the earliest advances were developed in Britain. Even where firms from other countries have taken an interest in the subject, their most spectacular work has been done not in the USA but in Europe. For the time being, architecture here remains less of a commodity and it is more accepted for corporate or national prestige to be expressed by means of spectacularly detailed structures – as with Pei Cobb Freed's two pyramids (one of them inverted) for the Louvre in Paris. Manufacturers continue to enter the market: St Gobain has just announced its own system, while Seele of Germany market a range of components that are particularly good in handling movement.

But as the market and technology advances, the role demanded of manufacturers is changing. According to Alan Brookes of Brookes Stacey Randall Fursdon structural glazing has still not attained the status of a commodity market and any attempt simply to use one manufacturer's system without careful adaptation of the details will lack the delicacy and refinement that is such an essential aspect of this technology. Now that the use of structural glazing has entered the mainstream of architectural practice, architects need suppliers who can back up good systems with the expertise to advise on their application. **WA**

The transparent touch



Ian Ritchie – the British architect of the recently completed glass hall at Leipzig's new exhibition centre by Von Gerkan, Marg and Partners – states his belief that glass, despite its popularity with designers in the last few years, deserves more research investment. The techniques used by Ritchie in Leipzig, have not significantly advanced from those he used at La Villette a decade ago. In conversation with Graham Vickers he explains why.

Ian Ritchie Architects is a firm in the vanguard of the structural use of glass. Ritchie himself, however, views glass as a material whose potential is still far from being fully explored, let alone fully exploited. Following his involvement with the Willis Faber building while working for Norman Foster in the seventies, and his later groundbreaking work in the mid-eighties at La Villette (with Rice Francis Ritchie), he continues to work on buildings that deploy glass in often unexpected ways. He will, however, acknowledge that there has been something of a hiatus in advances in the field in recent years.

"The principle of putting a bearing in a pane of glass so the glass itself can take very high loads – up to four tons through one hole – has not yet been surpassed" he maintains. "What I think has happened is a growing understanding of how glass takes forces within itself. Even so, by now one might have expected more detailed information to have come through about the molecular structure of glass."

Ritchie's own involvement with structural glass combines working practice with an ongoing advocacy for more research.

Initially invited to look at the glazing for the proposed Leipzig International Exhibition Centre, Ritchie declined on the grounds that the structure itself was of little interest. As a result Professor Marg of the building's architects Von Gerkan, Marg and Partners, was "generous enough" to invite Ritchie to come up with a concept for the whole structure; this led to a building with a major suspended glass barrel vault and a series of tubular glass bridges leading to exhibition halls and a conference centre. Whilst the glazed elements provide a compelling focus, they still operate very much as integrated parts of the total architectural space.

It was on his way back from a crucial meeting concerning load and impact tests relating to Leipzig's

Opposite page *Ian Ritchie.* ***Below*** *Leipzig Glass Hall, Germany opened in April 1996. (See further coverage in project reviews in this section).* ***Bottom*** *Terrasson experimental greenhouse in the Parc de l'imaginaire, Dordogne, France, 1995*

30,000 square metres of glass panels, that Ritchie came across an article in a Lufthansa flight magazine about research into organically modified ceramics. This prompted him to speculate whether it would be possible to condition (or, as he puts it, "dope") glass at molecular level.

"Would it be possible to overcome the inherent inability of glass to resist crack propagation whilst still retaining the optical and surface qualities associated with the material?" he wondered.

He is still wondering, having discovered by the empirical method that it is notoriously difficult for an architect to kick-start such expensive investigations. Despite some success in the past – bringing together three industries to develop a 50 percent light-transmitting permanent structure fabric (1983) and encouraging Electricité de France to work with an academic on the possibilities of controlling the 3-D form of visible light (1986) – Ritchie has so far had less luck in interesting the glass industries in the idea of organically engineering a new glass material.

"The credentials and ideas of architects" he notes dryly, "are all too often not those that industry will accept". Even so, he dares to hope that the notoriously secretive glass industries may already be exploring the molecular modification of glass behind closed doors.

Leipzig, for all its design credentials, represents no major advances in the use of structural glass. If Ritchie sees this partly as a symptom of the general slowing down of visible R&D, he also ascribes it to some degree to the particular nature of the Leipzig project.

"They wanted to get it done very quickly" he says. "The result was that the time to develop was extremely limited. We hardly had enough time to design it". Even so, the initial German government response to Ritchie's proposals was so cautious as to imply a spirit of avant garde adventurism on his part.

"I pointed out that there wasn't a DIN standard in Germany for what we were doing" Ritchie says. "Of course, that didn't make it innovative, it was just that they hadn't got round to accepting that you could do things like that. They're writing the DIN standards now, after the event".

If the basic structural ideas at Leipzig show no dramatic advance on what has been achieved before, the building does feature some innovative solutions to the problems of differential movement between glass and supporting structure, both in and out of plane. The project also marked the first major structural use of low-iron glass, which was supplied by US manufacturer PPG.

"We also used a silicone extrusion which took up the tolerance of movement in the assembly and a silicone seal which does the waterproofing" Ritchie says.

Discussing Ritchie's firm's work exclusively in terms of glass technology can, however, be doubly misleading.

Firstly, his work extends to other areas and other materials: current projects include London's Tower Bridge Theatre (folded steel plate, stainless steel mesh and stone fill); an open-air concert platform for Paxton's landscape bowl at Crystal Palace in south London (weathering steel plate); and mid-line vent and escape shafts for London's Jubilee Line subway extension (concrete and in situ black basalt solution).

Secondly, his concern with the architectural whole – "searching for that balance between space and light" – has little to do with the often narrow perspective of the materials specialist.

Another Ritchie project, The Royal Albert Dock Rowing Club and Boathouse uses glass in a rather unexpected structural way. This involves gabions that employ waste glass products – crushed glass inside a weather-tight seal – to create autonomous, self-supporting walls combining high thermal insulation with light transmission qualities.

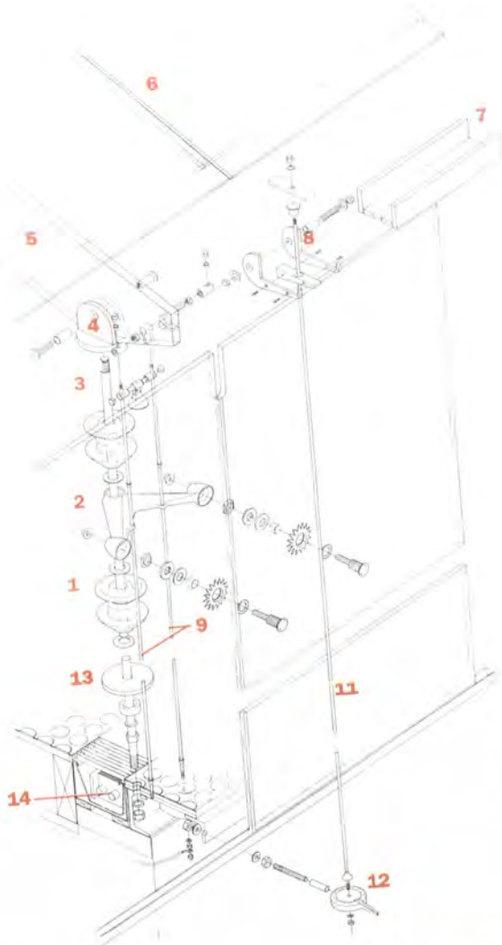
As far as the more conventional use of structural glass goes, Ritchie remains somewhat disappointed that the chief legacy of eighties' advances has been imitation rather than vision.

"I consider La Villette to have been a major shift in terms of glass performance" he says, "and yet what it produced was architectural measles – dots on every building you come across. On the other hand that measles is a sign of acceptance by clients. And at least the combination of the structural performance plus the pretty high energy performance you can now get out of coated glass, is encouraging a lot more people to look at it seriously as a building material". **WA**

Conservatory, South London, UK

Conservatory, South London

1. cast glass isolator
2. cast aluminium bracket
3. tensile stainless steel rod
4. stainless steel forked connector
5. toughened glass beam
6. double skin glass roof panel
7. toughened glass gutter
8. stainless steel gutter bracket
9. stainless steel lightning rod
10. 12mm toughened glass wall
11. stainless steel rainwater rod
12. bronze rainwater spout
13. stainless steel foot
14. fan assisted floor convector



Architects Bere Associates have employed a new and innovative construction method for a small conservatory for a listed house in South London. Situated at the back of the house at first floor level, this new glazed extension is supported by glass beams and columns made of stacked glass castings, providing much needed daylight to the dark, north facing kitchen.

The conservatory measures just nine square metres and is set against the back wall of the house and the brick boundary wall to the west. The two glazed walls, north and east, are single sheets of 12 millimetres toughened glass butt-jointed with silicone, and a door in the east wall leads on to the terrace beyond. The roof uses three frameless double glazed panels supported at the inner edge by two toughened glass beams that span from the wall of the house to two columns, set inside the glass wall. Rainwater is collected in a toughened glass box gutter and directed down a stainless steel rod to a fabricated bronze waterspout at ground level.

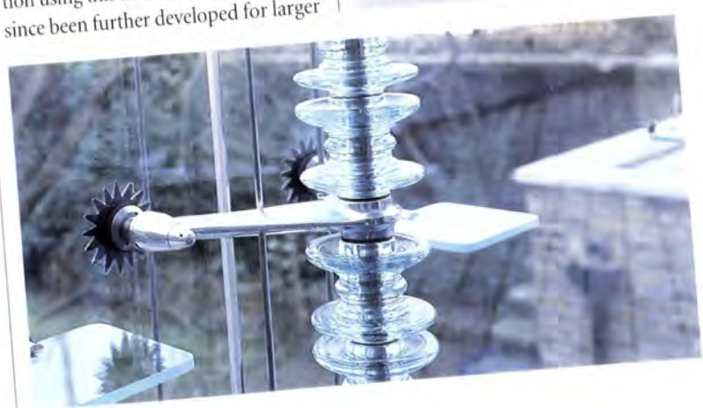
But it is the two columns that make the extension special. Formed from high tensile stainless steel rods threaded with cast glass isolators – a standard component commonly used to isolate high voltage cables on electricity pylons – the columns not only give structural support (each isolator can take a load of up to 18 tonnes), but become glittering features at night through the use of small dichroic luminaires.

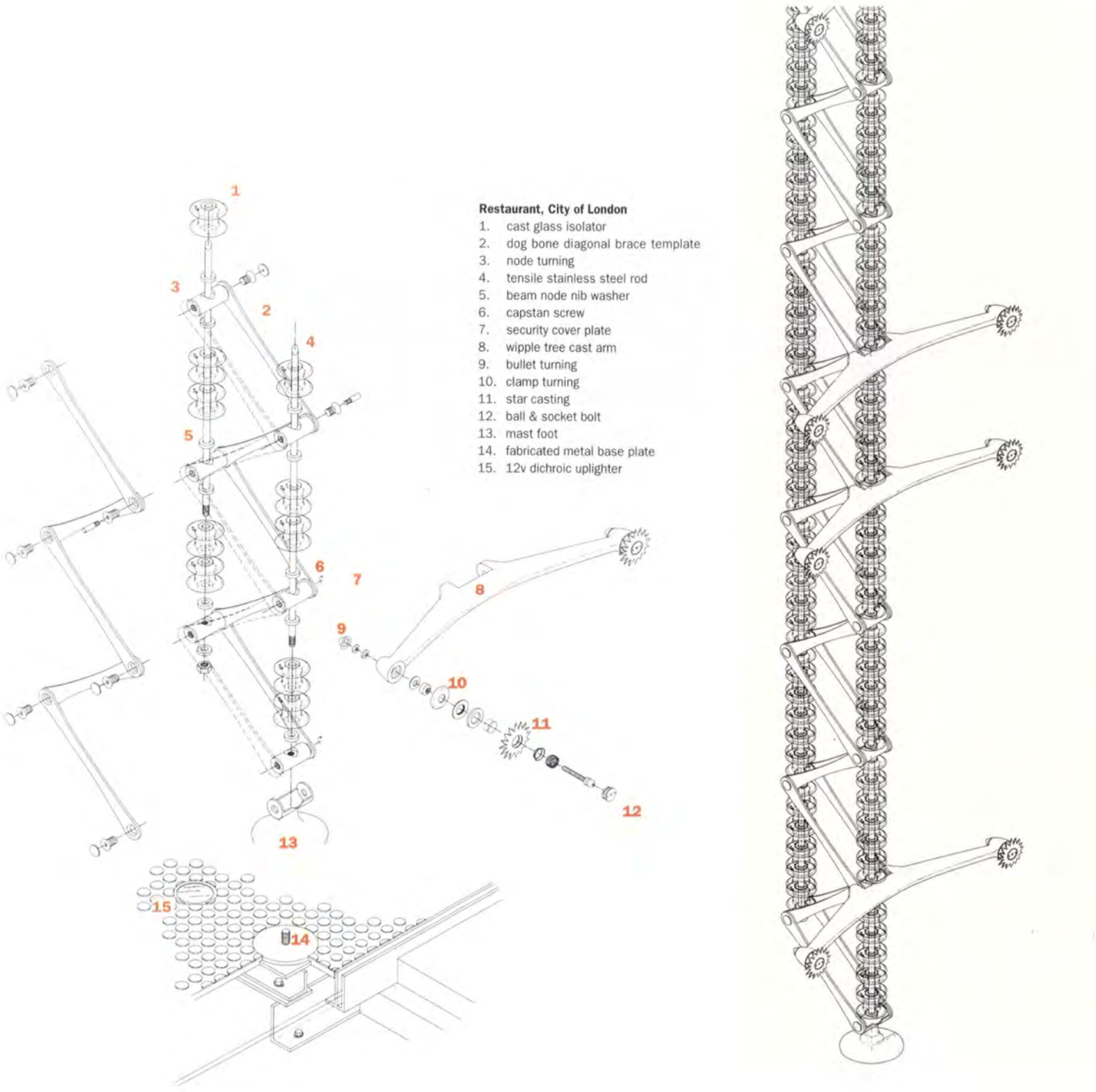
Purpose-made cast aluminium brackets, positioned between the glass isolators, also provide lateral support to the glass wall. These slot into holes made in the glass wall, with the bolt connections cleverly disguised by sunburst- shaped cast bronze washers. Small shelves fitted directly to the glass provide platforms for decorative objects. The conservatory is heated using fan assisted convectors set inside the walls at floor level. These create a curtain of warm air that rises to heat the main living space on the floor above.

The conservatory project, completed 18 months ago, was the first installation using this innovative system. It has since been further developed for larger

Conservatory, South London

Architects	Bere Associates
Project team	Justin Bere, Oliver Darlington, Kate Sandle
Structural Engineer	Campion & Partners
Contractor	Marcus Summers Structural Glazing Ltd
Glass	Pilkington
Cast aluminium	Essex Replica
Lasercut Metalwork	Laser Expertise
Photography	Michael Heyward





projects and even complete buildings. Bere Associates was recently approached to work on the glazed facade of a restaurant and wine bar in the City of London which is due for completion in June this year. For this latest project, the practice has teamed up with Marcus Summers Structural Glazing Ltd to design, manufacture and install two glazed walls, one each side of the restaurant. Here, the support has become two columns forming a double brace construction, which is designed to resist wind loads and torsion or twisting of the glass. Rather than being fixed at the edges, the brackets have been brought into the centre of the glass panel, allowing intermediate panels to be hung off the fixed panels. The result will be a feeling of lightness and space with unobstructed sheets of glass and fewer braces.

The system has also been designed for ease of transport and construction. The components are individually packed in crates for delivery and the columns assembled on site. Once assembled, a new universal foot joint allows the column to be lifted into position from any angle, and then simply turned and locked into position. **WA**

Restaurant, City of London	
Architects	Bere Associates
Project team	Justin Bere, Justin Richards, Johnathan Agnes, Sally Hichens
Structural Engineer	Campion & Partners
Contractors	Marcus Summers Structural Glazing Ltd, Westcrete Specialist Contractors
Glass	Saint-Gobain
Cast aluminium	Essex Replica
Precision machinists	Riverside Precision Products
Lasercut Metalwork	Laser Expertise
Metal plating	Pentonville Plating

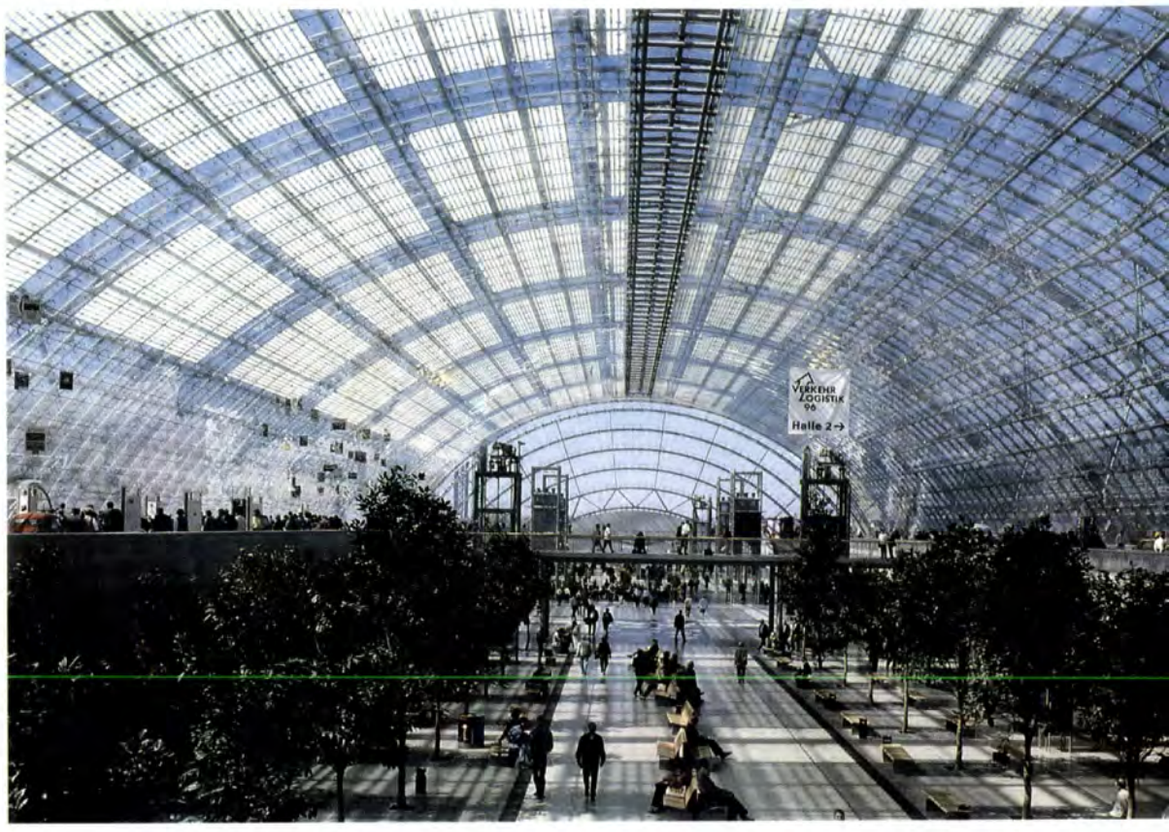
Exhibition & conference centre, Leipzig, Germany

Visitors to the new Leipzig Exhibition and Conference Centre, officially opened on 12 April 1996, enter through a large central glazed hall designed by Von Gerkan, Marg & Partners of Germany in collaboration with Ian Ritchie Architects from the UK.

It is a spectacular space, covering an area 240 metres long, 79 metres wide and 28 metres high, and designed to accommodate both reception and relaxation and play host to formal meetings and informal events. From here the visitor passes through to the surrounding exhibition spaces via fully glazed circular bridges.

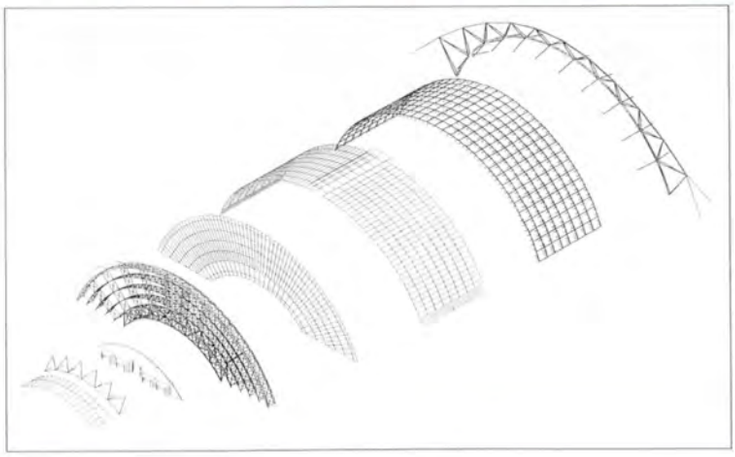
The architectural objective was to treat the hall as part of a landscaped valley between the exhibitions halls and conference buildings on either side, and to maintain maximum transparency within this landscape. To this end, the hall is enclosed in frameless glazing and the structure kept to a minimum, providing just 15 percent of the total visual surface. The primary structure is ten arched trusses built at 25 metre intervals, which span the vault planting their feet beyond the roads on either side. This provides stability for the tubular grid shell with outriggers providing additional anchorage between the trusses. The glass skin is suspended 500 millimetres inside the grid shell, with each pane held by cast steel arms with four point fixings. End walls are structurally independent, designed as a series of interconnected arch trusses cantilevered from the ground.

In any structure of this nature, movement due to heat or wind is a prime concern. Here the architects have devised a range of fixings with integral ball bearings, which give the glass panes a certain amount of freedom while the supporting grid and cast steel arms take the bulk of the movement. These sophisticated fixings are capable of taking a load of up to four tonnes. The glass itself is attached to the cast steel arms at four points, one of which is fixed and three which allow different degrees of movement. The flexibility of the silicone joints deals with movement of the glass out of the plane.



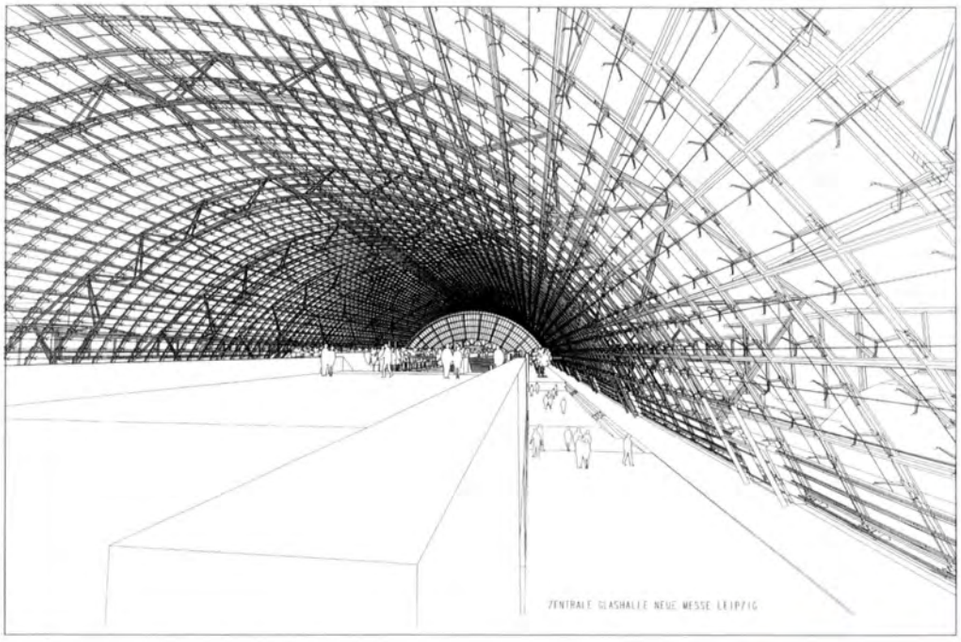
Smoke and escape doors in the side walls of the hall have been specially designed to overcome the 70 degree angle from ground level, with an operating mechanism akin to a guillotine. Motor driven counter weights are programmed to release automatically when smoke is detected.

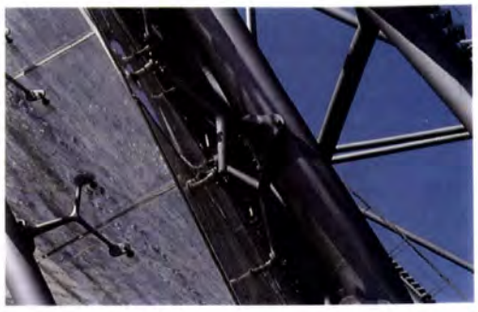
The climate in the glass hall is intended to be semi-external with stone paving and full height trees creating the atmosphere. In the winter, the temperature is raised by convector heating along the sides of the hall and underfloor heating which permeates the paving. In the hotter summer months, through-ventilation is provided by computer controlled louvres at ground level and gullwing louvres along the spine of the vault. Solar heat gain is controlled by the use of fritted glass on the south face of the hall and sprinklers fixed onto the grid shell which add to the cooling effect by spraying filtered and deionised rainwater onto the glass. This also serves to keep the glass skin clean.

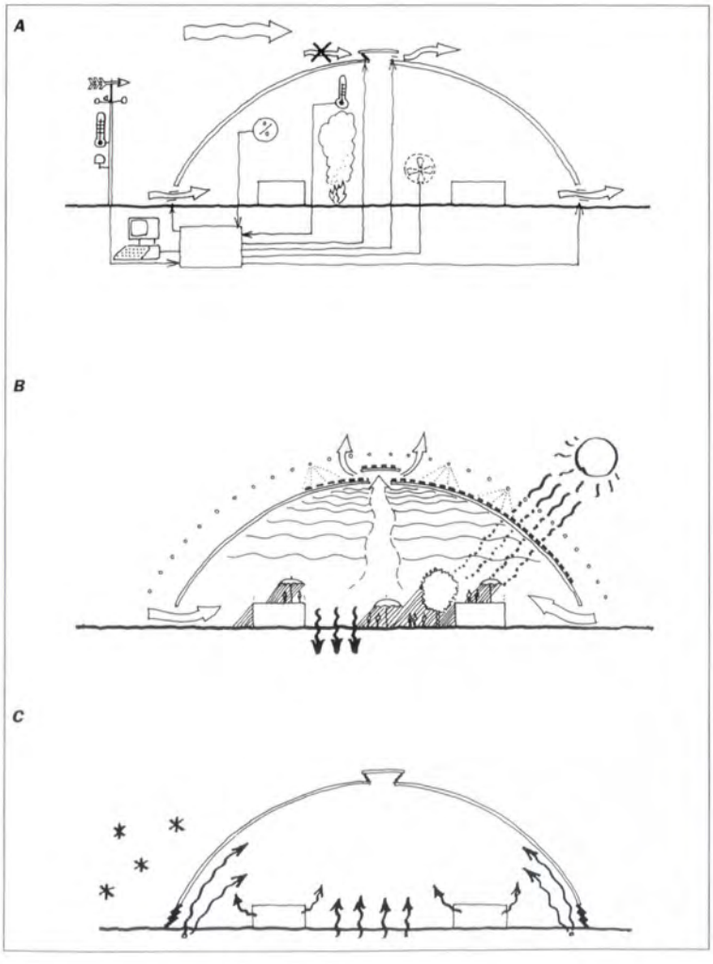


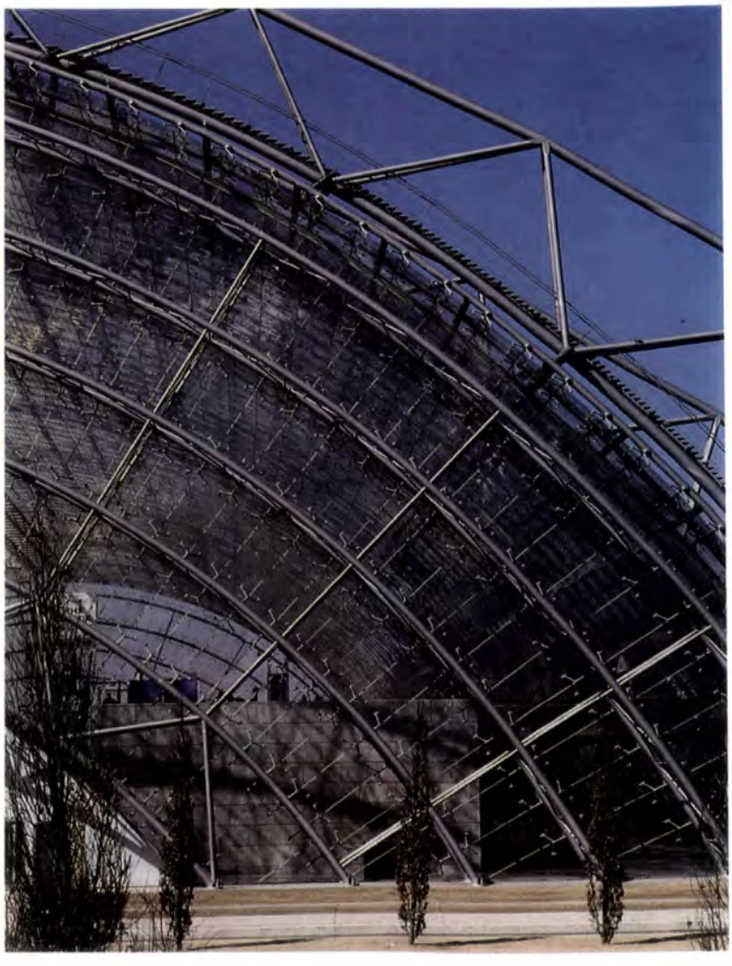
Masterplan architects	Von Gerkan Marg und Partner Architekten
Architects of glass hall	Ian Ritchie Architects
Project team	Ian Ritchie, Simon Conolly, Henning Rambow, Elden Croy, John Randle
Structural engineers	IPP Köln (assistance to Ian Ritchie Architects from Ove Arup & Partners)
Environmental engineers	HL Technik München
Landscape architects	Wehberg Lange Eppinger Schmidtke
Principal contractors	Mero Raumstruktur, Glasbau Seele
Photographer	Jocelyne Van den Bossche

Opposite page *Interior of the glass hall and axonometric showing the structural heirarchy of the vault.* ***This page, top left*** *The specially designed fire escape door to the right.* ***Bottom left*** *A. Environmental control system. B. Summer conditions: natural ventilation, floor cooling, fritted glass and sprinklers on the south face. C. Winter conditions: convector and underfloor heating raise the internal temperature.* ***Top right*** *Cast steel arms connect the glass to the grid at the end wall (top) and the vault structure (below).* ***Bottom right*** *The heirarchy of the vault construction can be clearly seen*









Bibliothèque Nationale de France, Paris

The notorious new Bibliothèque Nationale de France, designed by young French architect Dominique Perrault and the last of François Mitterand's *Grands Projets*, will be opened to readers and the public this autumn. Situated on the banks of the River Seine to the east side of Paris, the site is dominated by four L-shaped glass towers, designed to resemble four open books, grouped around a central square. The lower portion of the building, including reception and reading rooms, looks out onto the central garden where full height trees have been planted, poking their heads above deck at the foot of the towers.

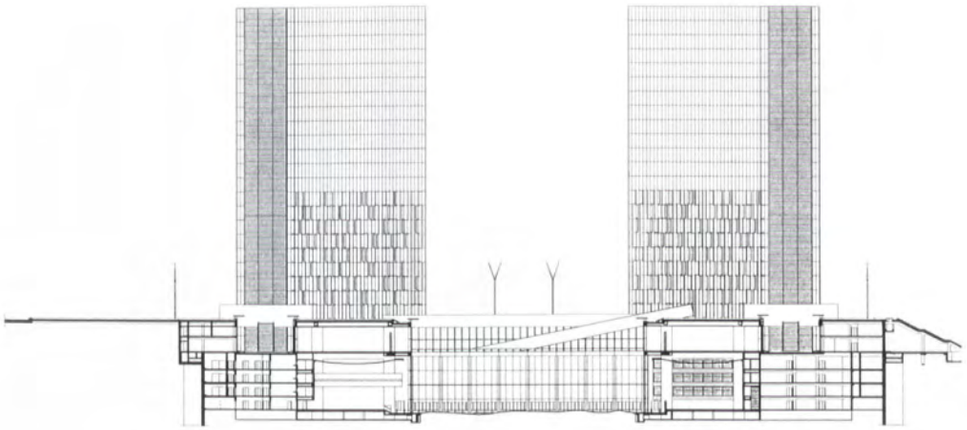
Despite its monumental size, all the elements and materials for the project have been fully researched, in particular the glazing of the facade. Perrault's objective was "to envelop the building in a skin of the most transparent glass possible, formed of large panes". At an early stage in the proejct, he teamed up with French-owned Saint-Gobain to develop a glass product which could be manufactured in sufficient quantities, within the prescribed deadline and meet the required fire safety standards.

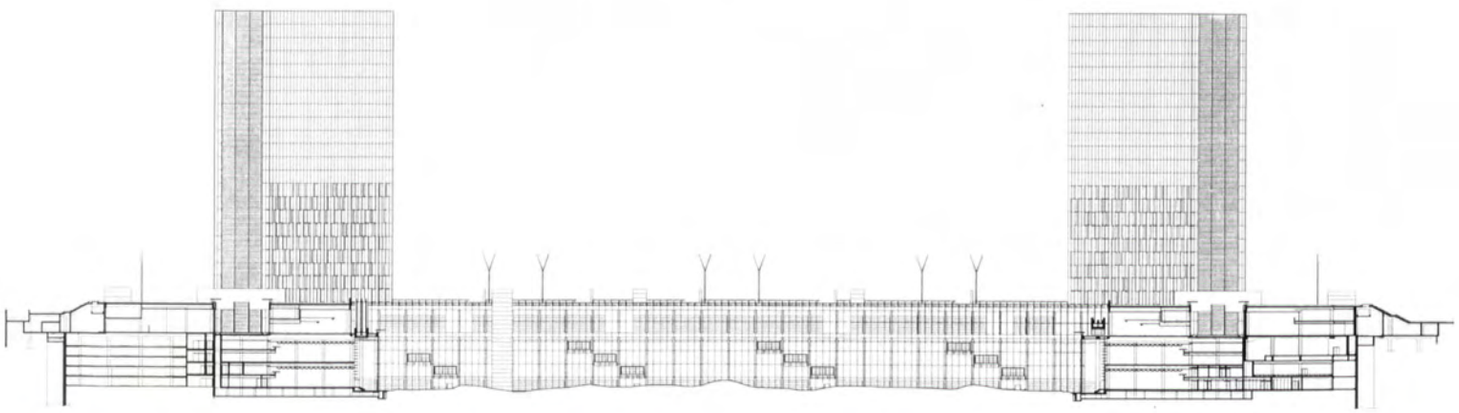
The result is an extra-clear Securiflam laminated glass developed at the Saint-Gobain float works in Belgium who manufactured 270,000 square metres of glass for the double glazed units. A factory in the French region of Aisne processed 67,500 square metres into the half hour fire-rated Securiflam laminated safety glass. Finally, the Rinaldi Structural company manufactured the double glazed units with a 9.3 millimetre air cavity between an outer pane of 12 millimetre laminated glass and an inner leaf of 20 millimetre laminated Securiflam glass. It is the first time that glass of this transparency and thickness has been manufactured on an industrial scale with panes measuring 1.8 metres wide and 3.6 metres high.

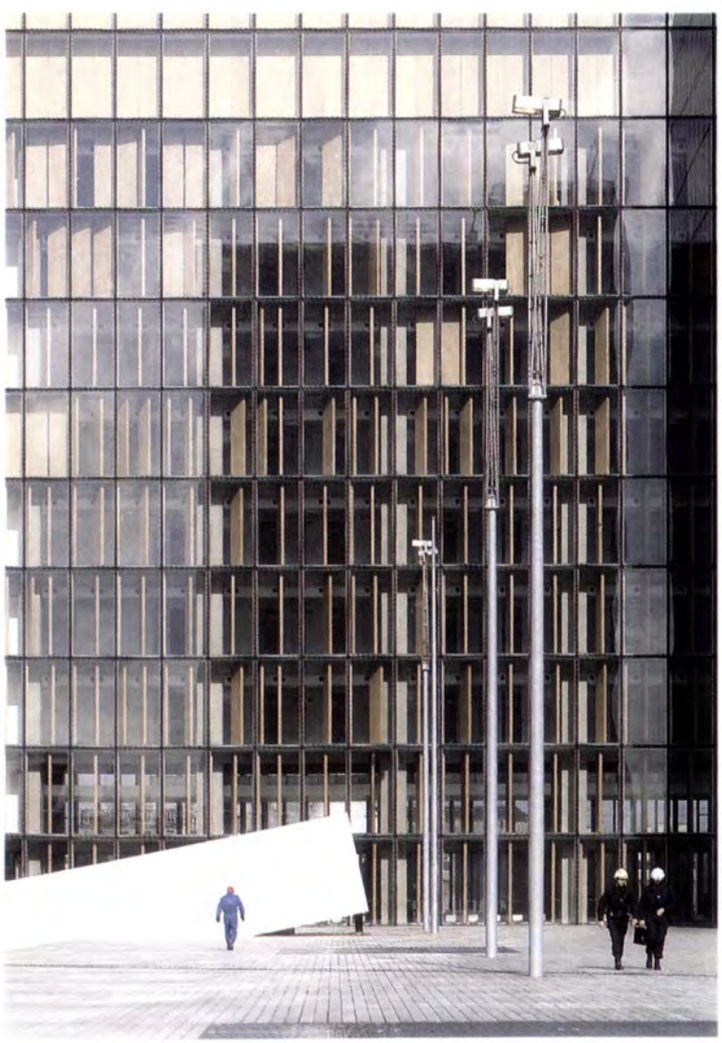
The transparency has been achieved by introducing a chemical compound in the glass making process which increases the transmission of a yellow spectrum light into the interiors, thereby reducing the risk of fading to both the internal wooden shutters and the interior fittings. Apart from the facades, the ultra-clear glass has also been used to partition the interior spaces, fulfilling the acoustic insulation requirements of libraries.

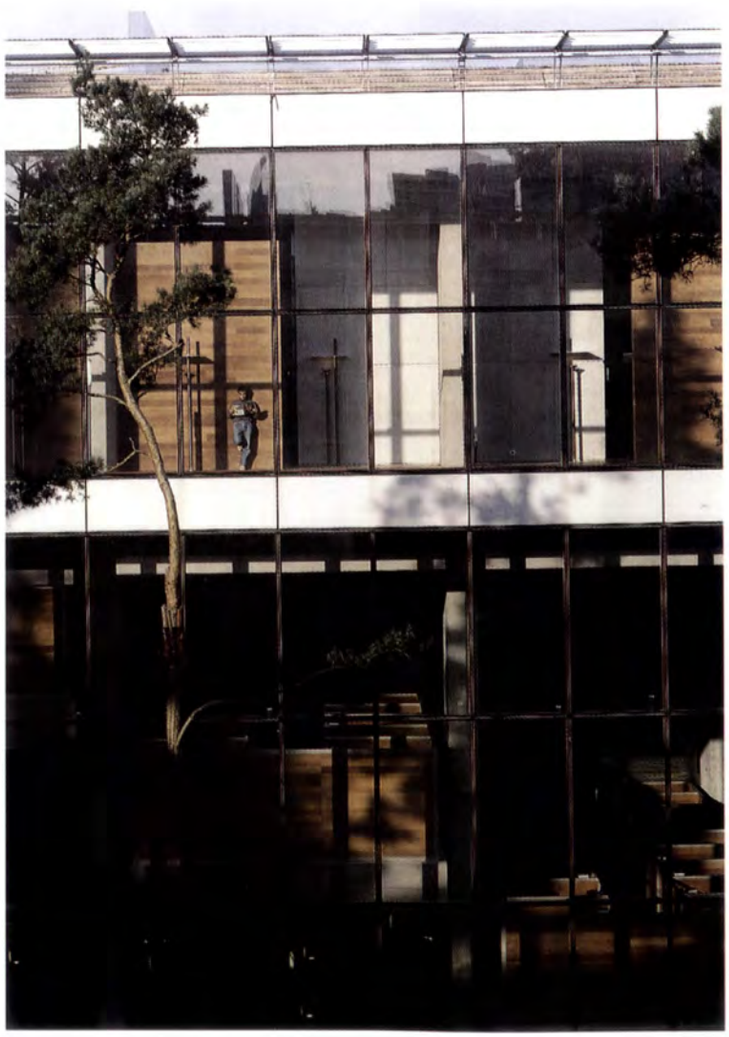
Above *The four "open books" of Perrault's new library.* ***Left and opposite page bottom*** *The building's towers have been enveloped in "the most transparent glass possible" – Securiflam laminated glass.* ***Opposite page top*** *Transverse section and longitudinal section,* ***below***

Client	Bibliothèque Nationale de France
Chief Architect	Dominique Perrault
Architectural Engineering	Perrault Associés SA
Glazing	Saint-Gobain
Photographer	Georges Fessy

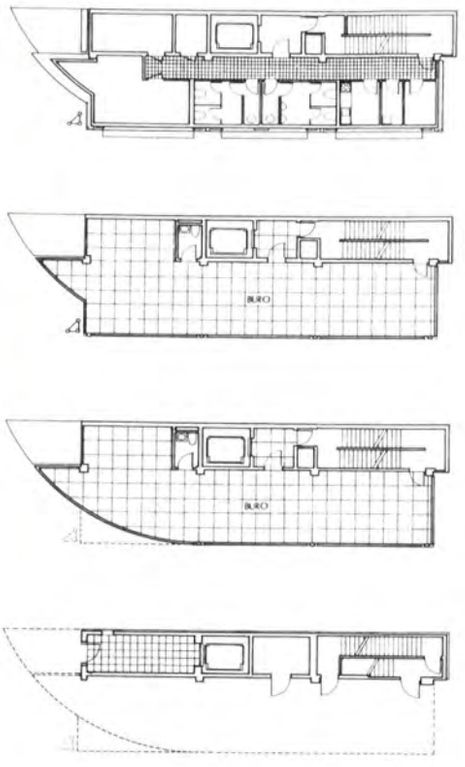








Kurfürstendamm 70
Berlin, Germany



Above from the top *7th floor plan; 3rd-6th floor plan; 1st and 2nd floor plan; ground floor plan*

Kurfürstendamm 70, or Ku-damm 70 as it has come to be known, is the first building of a series to be completed on this major street in central Berlin. Designed by Murphy/Jahn, Chicago, it is a remarkable achievement constructed on a site width of only 2.9 metres.

The site had been vacant for over forty years until the owner decided to hold a competition for an eight storey office building. Murphy/Jahn's winning design is an eye catching corner solution that has become a marker on the Kurfürstendamm, reinforced through its knife-like plan and steel mast with its sign. To quote the architects "it is urban repair, covering the end of a building exposed through insensitive and destructive street planning in the 1950s".

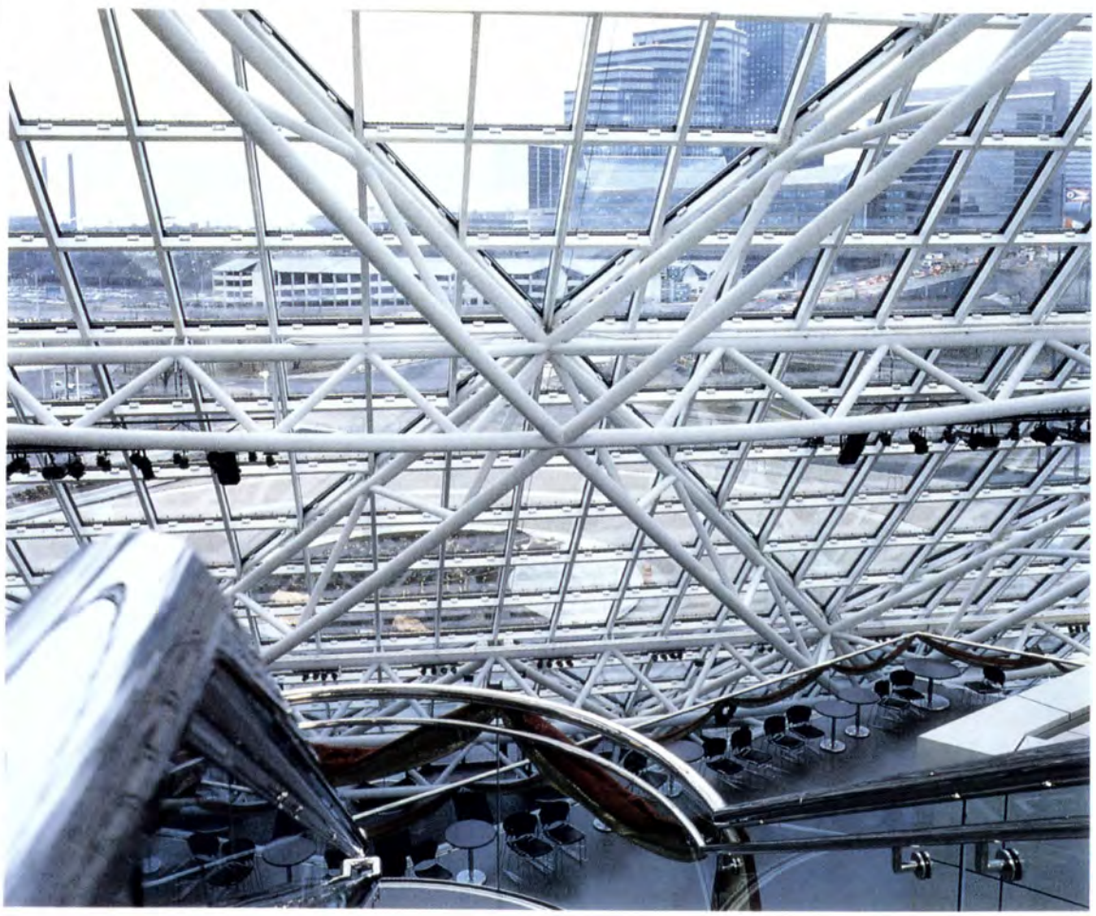
Due to the constraints of the site and to maximise floor area, the city allowed the architects to cantilever the building over the pedestrian walk on Ku-Damm and Lewishamstrasse and to exceed the height of the adjacent building. The three metre wide supporting core in concrete houses the total functional infrastructure of the building – the lift, emergency stairs, and services. The steel floors are hung from the service core providing seven floors of usable area which project over the pavement. The result is 800 square metres of office space on a site area of just 60 square metres. The glazed facade is a special version of Schüco's SG50N structural glazing system which provides an all-glass skin. The supporting structure of this system consists of a mullion-transom construction with 50 millimetre internal exposed width, concealed on the outside by the double glazing units. This basic design allows the easy installation and locking of the prefabricated insert elements. At Ku-damm 70, the construction has been deliberately built out on alternate floors to create a patterning on the facade, accentuated further by the use of fritted glass to create different transparencies. The 50 degree point or blade at the south east corner consists of a special profile with interior reinforced rib.

Client	EUWO Unternehmensgruppe
Architect	Murphy/Jahn
Project Team	Helmut Jahn, Rainer Schildknecht, Steven Cook, Sanford Gorshow
Mechanical Engineer	Ing. Buero Wilhelm Lutz VDI
Structural Engineer	Friedrich Mueller
General Contractor	CogefarImpresit
Facade Sub-Contractor	BERTI
Structural Glazing	Schüco
Photographer	HG Esch

Rock and Roll Hall of Fame and Museum, Cleveland, Ohio

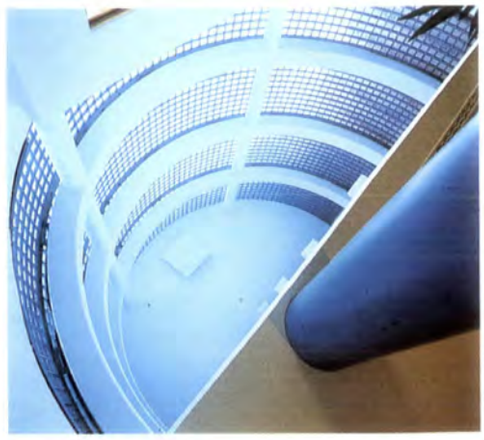
The new Rock and Roll Hall of Fame, designed by architects Pei Cobb Freed & Partners looks set to become a landmark building on the edge of Lake Erie, with the general public at least. This new 150,000 square foot construction cost a total of US$92 million and is home to interactive computer exhibits, video displays and paraphernalia from the world of rock music.

Architecturally, the design of the building offers nothing new. The aluminium clad central tower rises 167 feet out of the lakeside, with two distinctive geometric structures jutting out at each side. The main entrance to these exhibit areas is via a triangular glass tent, not unlike the Louvre pyramid, which leans heavily against the main structure. It is constructed from steel pipe columns and bow trusses and has been engineered to withstand winds up to 150 miles per hour. The glazing involves a new glass coating from Viracon called Solarscreen 2000, which reduces infrared transmission and solar heat gain while allowing up to 70 percent visible light transmission. By comparison, most clear glass transmits 79 percent of sunlight but doesn't provide protection against solar heat gain. This difference is solar control is achieved by applying a thin metal coating to the float glass substrate. There are eight different tints available, each with different performance characteristics which vary according to the thickness of the glass specified, or the specific fabrication process. Another characteristic of Solarscreen 2000 is that it provides less reflectance than uncoated clear insulating units making it particularly suitable for areas requiring high levels of light. The end result is something the company describe as "cool daylight".



Architect	Pei Cobb Freed & Partners, New York City
Associate Architect	Robert P Madison International, Cleveland
Structural Engineer	Leslie E Robertson Associates
General Contractor	Turner Construction
Glazing Contractor	Flour City Architectural Metals & United Skys
Glazing	Viracon, who also provided the photographs above

Portfolio



Oberland Glas

Oberland Glas are manufacturers of Solaris glass bricks which have been specified throughout Europe for a variety of different projects.

A large cylindrical tower built from blue Solaris glass bricks is the main feature of this hotel and service complex in Halle-Neustadt, Germany. Sunlight penetrates through to the interior giving character and accent lighting to the entrance and internal spaces.
Architects: Hermann & Valentiny, Wien-Luxemburg
Photograph: Solaris glass bricks/Bouwmag/De Steltenberg Groep

The world's largest suspended glass block wall of pre-fabricated elements (above) at the Destructor Station Cridor, La Chaux-de-Fonds, Switzerland. Constructed from Solaris glass bricks model Clearview, the wall is 17 metres high and 60 metres wide, and has been designed with external supporting columns.
Architects: R+P Studer, Neuchâtel
Photograph: Solaris glass bricks/Gabella Verres SA

The facade at the Academy of Art in Maastricht, Netherlands, (right) is constructed from Solaris glass bricks which allows natural daylight into the working environment while providing the required degree of privacy.
Architects: Wiel Arets, Heerlen
Photograph: Solaris glass bricks/Bouwmag/De Steltenberg Groep

A private house in Bad Weindsheim, Germany (left) where Solaris glass bricks have been used to create a curved glazed facade which offers a high degree of safety against burglary.
Architects: Gudrun Wurlitzer, Cologne
Photograph: Solaris glass bricks/Häuser/Willig

Oberland Glas AG
Siemensstrasse 1, D - 56422 Wirges, Germany
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Fax: + 49 26 02 68 14 25

Velfac
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Saint-Gobain
Saint-Gobain worked closely with architect Dominique Perrault to develop Securiflam extra-clear laminated fire safety glass for the Bibliothèque Nationale de France in Paris.

Saint-Gobain Glass UK Ltd
19 Dunraven Street, London
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Fax: +41 71 761 22 70

Hawa
HAWA-Variotec 100/G has been used worldwide to enhance the look of glass constructions, from the Louvre in Paris, to a cafeteria in New York, a bank in Taipei and a casino in Budapest.

Hawa AG
CH-8932 Mettmenstetten, Switzerland
Tel: +41 1 767 91 91
Fax: +41 1 767 91 78

Kömmerling
The Town Hall in the Spandau district of Berlin has recently undergone a refurbishment programme which included replacing the old timber framed windows. Kömmerling's VK system of PVC-U windows was chosen to provide insulation against road traffic noise and reduce future maintenance costs. Aesthetically decorated mullions and special wide transoms have been used to replicate the original timber design.

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