



# The New EIB Building

BY PETER BOND

The Bank has always ensured that the functionality and efficient operation of its own office buildings predominate in their design. This does not mean that the buildings are not attractive or interesting architecturally but that the exterior image is the natural outcome of good integrated design and not the primary objective. The Bank's greatest asset is its staff and their efficient operation, good morale and health depend directly on the quality of the building in which they work. Nevertheless the buildings should reflect overall the Bank's image of soundness, stability and efficiency.

This article describes not only the new building but also the manner in which it was conceived and created. The Bank is a project financing

institution and this brush with the reality of commercial life has been a rewarding and challenging experience.

## ► Antecedents

In the early days the Bank used rented accommodation initially in Brussels and then in Luxembourg City, at Place de Metz and numerous other locations. In the mid-1970s this was becoming unsatisfactory and, with its future assured, the Bank decided to construct its own new offices on the Kirchberg plateau.

After appropriate design competitions, Sir Denys Lasdun (UK) was selected as the architect. At that time the total staff of the Bank was under 300 but with foresight the new building was sized for 800.



The EIB's first permanent building was designed by Sir Denys Lasdun. The chair sculpture by Magdalena Jetelová was installed in 1999.

The building was commissioned in 1980 and comprised an elegant crucifix form set in a spacious garden site, with one wing initially let out to tenants. The design and construction processes underlined the need for strong project management and the simplification of the contractual interfaces. The resulting building has proved itself to be excellent in operation and has stood up well over time, now being nearly 30 years old.

The Bank continued its sustained and rapid development, which meant inevitably that further space was required and this was provided by an extension for 300 staff also designed by Sir Denys Lasdun's office (DLPSA), to ensure harmony and integration with the parent building. Stronger and earlier independent project management helped

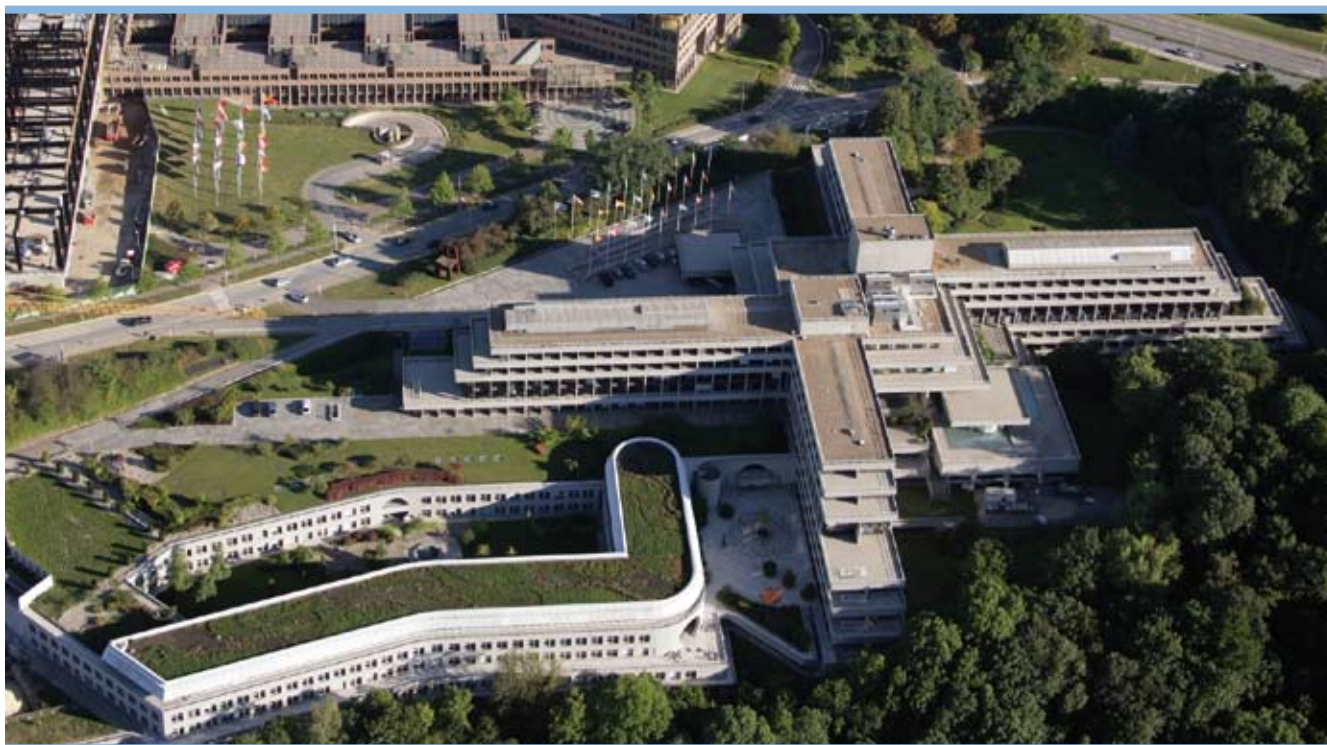
ensure that the budget and timetable were both respected.

These two buildings are now termed the "West Building".

► **Genesis**

In the late 1990s, the Luxembourg authorities established a long-term master plan for the Kirchberg plateau under the guidance of the Spanish architect Ricardo Bofill, which confirmed and ordered the plateau's more intensive urbanisation.

Meanwhile, the Bank's role and activities continued to develop. This inevitably led to more staff being required and serious efforts were made to contain the increase. The nature of the Bank's



This aerial view shows the original building (right) and the extension (bottom left).



**ABOVE AND OPPOSITE** The year after the EIB's first permanent building opened a special record was commissioned from the celebrated architectural photographer John Donat.

operations means that the great majority of the staff needs to be based in Luxembourg and preferably together for operational efficiency. Detailed studies indicated the likely growth of staff in Luxembourg to rise from 1,100 (the design capacity of the two Lasdun-designed

buildings) in about the year 2000 to a predicted 1,500 by the year 2010 and about 1,850 in the year 2015. It was clear that further capacity was urgently needed.

Numerous options were considered to provide this extra capacity. These included long-term renting, the purchasing of additional office space elsewhere and the extreme option of building anew and moving completely from the existing buildings. Phasing was also considered to provide flexibility and initially incorporated in the new building proposal but later dropped for reasons of economy and practical convenience. The final strategic decision was that a new building should be constructed adjacent to the existing buildings to the north-east with a total capacity of 750 to 800 staff, giving a planning horizon of about 10 years. This new building is now called the "East Building".

In 2001, independent consultants were retained to define the detailed needs and outline specifications for new offices with similar criteria as for the West Building but updated to anticipate future trends in working practices and expectations. The relationship with the existing buildings in terms of function also needed early decisions. The meeting rooms (except for the main Board of Directors' meeting room) and cafeteria, dining areas and associated kitchens were to be located in the new building, providing a single focal point for the staff. The Management Committee's offices and the sport facilities would remain where they were, with the latter being enhanced after commissioning of the new building. By 2002, with the overall ideas firmed up, the Bank approached designers to develop a scheme.



### ► **Organisation**

At an early stage an internal Task Force was set up under a senior director (subsequently the Director General for Strategy and Corporate Centre) responsible to Vice President Wolfgang Roth (subsequently Vice President Simon Brooks). It comprised permanently allocated Bank staff and advisers with the task to manage and coordinate the project from the Bank's side. Amongst the other tasks it would ensure close working with the internal Facilities Management department, responsible for the buildings' operation and maintenance.

The overall organisation of the project orchestrated by the Task Force may be succinctly summarised as follows:

- The Project Manager, appointed early in the process, to manage initially the design contract and later the construction contracts.
- Specialist Lawyers to undertake the legal contract documents and assist the Bank in legal matters such as claims.
- The Design Team comprised the architect, the structural engineers, the service engineers and other design experts.
- The Contractors to undertake the construction work and some associated design.
- The Technical Control Office, appointed by the Luxembourg authorities, to ensure that the standards were respected and that the 10-year guarantee could be obtained.
- A Disputes Resolution Board (DRB) was set up with three independent experts to assist in resolving disputes with the Main Contractor. A provision for disputes resolution also exists for the Design Team.



### ► **The contract strategy and procurement**

The Bank followed the EU Directives on procurement for goods and services. Every effort was made to ensure as open and wide a competition as possible. Internationally accepted criteria and Eurocode standards (when applicable) were used, and the contracts were made under Luxembourg law.



A key decision was to make English the contractual language as this provided a neutral base for most likely competitors. In the event this worked out well as although there was initial interest from mother tongue English firms none was eventually contracted.

Another strategic decision was to reduce the contractual interfaces by having the minimum number of contracts directly with the Bank and encouraging an integrated holistic approach. Thus the Design Team combined under one contract all the architectural, structural, service engineering and other design activities in an integrated coordinated package. A similar approach was used with the Main Contractor who had to integrate all the construction activities under one contract.

The contract strategy concerning the design responsibility was considered at length with the options ranging from design-and-build through contract management to the traditional separation of design from construction. The Bank placed high importance on the quality of the final building but also required a cost-effective project to an agreed budget and to be completed on time. It was concluded that the Bank's special needs required a rather complete architect/engineers design which would be put out to tender for construction, an approach used in the previous Bank's buildings with general success. As the project developed and its nature became clearer this approach was slightly modified to allow more scope for the Contractor to design the straightforward aspects of the structure under the control of the Design Team.

The Project Manager and Design Team were selected after international tenders with pre-selection. The contract was awarded to a joint

venture of Jacobs Serete (France) and Paul Wurth (Luxembourg). For the Design Team competition, a pre-selection was followed by a two-stage design competition under an international Jury chaired by Ricardo Bofill. The selected Design Team was German and headed by Ingenhoven Architects (current name of firm) with Werner Sobek as structural engineers, HL Technic (subsequently replaced by Pbe-Beljuli and IC Consult) as service engineers and DS Plan for building physics.

In a similar manner the construction contracts were put out to international tender with pre-selection.

#### ► **The design and its development**

The design presented by the Ingenhoven Design Team received the overwhelming support of the competition jury. Some doubts were raised on the costs and the complexity and maintainability of the roof and façades but in general the imaginative concept was well recognised. It was different in style from the Lasdun-designed buildings with their predominant horizontality and emphasis on exposed concrete, but by its positioning away from the parent building it provided an interesting comparison rather than a conflict and was considered to reflect an updated and appropriate image for the Bank.

#### *The physical description*

The new building ingeniously fills the long narrow site and by providing a folded "concertina" or zigzag plan form manages to provide light and elegance for the interior. A particularly striking but logical and clean outside appearance is provided by the all-enveloping cylindrical form of glass and steel.

The building provides offices for 750 staff with associated facilities, making the total capacity of the Bank's complex 1850. Parking is provided for 450 extra cars, making the total capacity 1,250 cars. The new building has total floor area of 72,500 m<sup>2</sup> and comprises 11 storeys with three below ground level. It has a total length of 170 m, maximum height above ground level of 35 m, and base width of 50 m.

A distinctive feature is the incorporation of atria between the wings (fingers) which have an important aesthetic and practical function. On the entrances side facing Boulevard Konrad Adenauer the three "warm" atria are used continuously by staff, and so require a controlled internal environ-

ment. In contrast the atria on the valley side are not in continuous use and are only controlled by direct external ventilation. These "north" atria provide a pleasant green space for quiet relaxation and the temperature could descend to as low as 6°C in mid-winter. The role of these atria is important in the environmental control of the building by providing buffer zones to modulate temperature swings.

The new East Building is linked to the existing West Building by a corridor at level 3, one level below the main entrance level. This major passageway linking the main buildings is a central point of the complex where facilities such as the retail bank, the travel office and a shop will be located.



This view from the north shows work in progress on the EIB's new building (foreground) in September 2006.



The cafeteria is situated adjacent to the link corridor and has an agreeable outlook with access onto a terrace area at the roof level of the extension building.

The offices are disposed in the so-called fingers, with a junction or meeting point between adjacent fingers where such general items as photocopiers and drinks facilities are located in a convivial setting. The offices can be arranged with two main options, one with larger offices and smaller central corridor (similar to the original West Building) and the other with a wide corridor and smaller or grouped offices. Thus individual or open offices can be provided. The offices are disposed in blocks of

convenient size for a department, encouraging the feeling of identity and working together. Access between fingers is provided by bridges which link to the lifts and, for those with a fear of heights, alternative routes are provided via an enclosed lift in every other finger.

The main staff dining area and the special dining areas for guests as well as the associated kitchen and storage areas are all located in the East Building. The main dining area is at level 2 and with seating for 500 can cater for the full occupation of the building. A less formal area for light meals is also provided. The very spacious dining area may be used to assemble all the staff. The management dining rooms are situated two floors above at main entrance level and provide flexible capacity able to cater for lunch for the Board of Directors' meetings as well as for smaller events.

A block of meeting rooms of various sizes is located on level 3. The library will be re-located in the East Building.

The area outside the main entrance will be paved and be linked with the West Building. Vehicle access including service vehicles will be by a spiral ramp at the north end and the new visitors' car park will have a separate entrance. The zone on the valley side, which will include an emergency access road, will be left in its natural wooded state.

#### *Technical aspects*

The structure of the building ranges from straightforward to complex.

The foundations comprising concrete pads and beams were straightforward, without problems in design or construction. The lower structure comprises traditional reinforced concrete flat slabs



Another work in progress shot taken in December 2006.

supported on circular concrete columns, all braced for horizontal loads by lift shafts and stairwells. An unusual design feature is that the building (some 170 m in length) has been designed without movement joints, which requires extra reinforcement steel but simplifies the visual aspect.

Above level 4 the zigzag form commences and the concrete flat slabs, circular columns, lift shafts and stairwells continue but curved tubular beams provide the main support for the steel and glass roof and for intermediate slabs. These curved beams are very visible giving a clear meaning to the support structure and consist of high quality steel filled with reinforced concrete. Special joints are required from the beams to the slabs and the roof structure to reduce secondary effects.

The original roof structure included stressed cables and this concept was later simplified to a triangulated steel frame with an aluminium sub-frame supporting the glass panels, providing a more economic solution with easier access for cleaning and maintenance. Special equipment is required for this including an in-situ robot cleaner on the outside. The external façades comprise two main types. Facing the Boulevard Konrad Adenauer the glass panels are supported by pre-stressed steel cables, up to 25 m in height, which connect to major steel beams, spanning across the atria and providing a bold and dramatic effect. The internal façades, which open onto the interior atria, have wooden frames. The glass is of high quality with very low conductivity and of brilliant white colour.

The overall stability of the building has been designed to ensure satisfactory performance under normal loads but also to withstand unusual loads without progressive collapse. Special wind tunnel

tests and studies were undertaken to ensure satisfactory design criteria taking into account the recent systemic increase in wind speeds.

The internal environment in terms of temperature, humidity, ventilation and airflow and the energy optimisation was addressed in detail from an early stage and was subject to numerous studies and simulations. The overall ecological design concept was to favour natural ventilation, solar heat and daylight to the maximum extent possible, for example with the atria as thermal buffer zones and abundant use of glass. This approach shifted the emphasis from heating to cooling as the key requirement but the overall energy needs are reduced and are significantly less than for traditional buildings. The East Building has the same comfort criteria as for the West Buildings.

The whole building complex is connected to the Kirchberg district heating system, which provides primary energy as hot water from a gas fired electrical power station. The Bank installed its own co-generation plant in the extension building (1995) but as the official policy changed and required connection to the new local system, the Bank's plant was superseded. This hot water source is used for heating the building as well as domestic and kitchen use and it also supplies the desiccant cooling system, which provides cooling. The offices are heated by floor induction units and by conditioned fresh air through the ventilation system. Cooling can be provided by the induction units, supported by a thermal mass activation system, which cools the concrete slabs with cold water. The offices are provided with sunshades, which can be individually or centrally controlled. The users, within limits, may control the temperature in each





office to suit their own preferences. Provision has been made to double the induction units in the offices if greater heating or cooling capacity is found necessary in the long term. The warm atria have radiant floor heating and some induction units, while the north atria are unheated. Special façade heating is included in the warm atria as well as provision to control vertical air movements. The meeting rooms, dining areas and kitchens have full air conditioning and induction units. The atria have external ventilation and special shading screens, both systems being automatically and optimally controlled to match and anticipate conditions.

From the earliest stage of the project, the environmental impacts in their widest sense were of major interest to the Bank. A review of available environmental assessment systems for buildings found that the most developed and relevant approach was the UK's BREEAM (Building Research Establishment's Environmental Assessment Method) which was eventually adopted. The BREEAM assessment was undertaken by independent BRE accredited consultants and covered all aspects including the construction activities, the materials used, the comfort and health of users as well as external impacts. It was undertaken at the design stage and so was able to influence the final scheme. The building was certified as "very good", just below the highest rating of "excellent". The review process continued after the initial assessment to monitor the construction activities and the commissioning. This is the first time that a major building outside the UK has been so assessed and it was considered to be very positive by the Bank who may extend this approach to other activities.

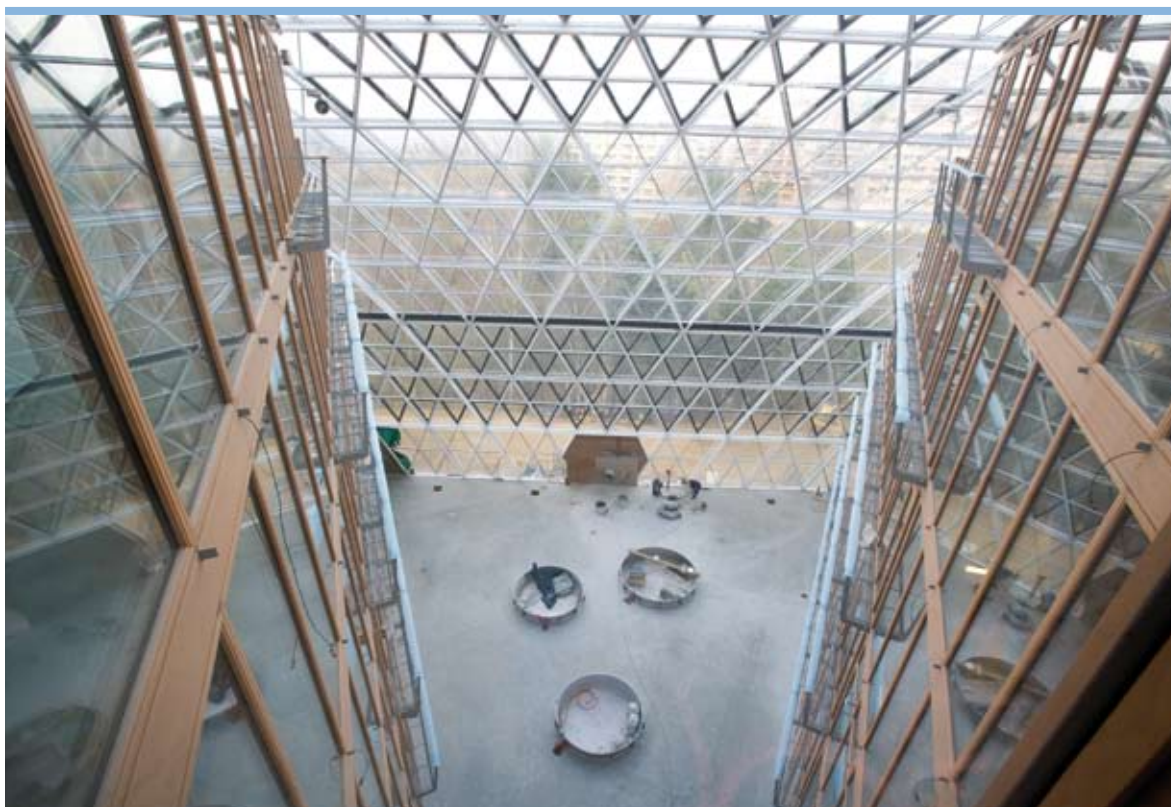
During the development of the design several independent and specific technical reviews were carried out into such critical areas as the roof and façade design and the internal environment and these were found to be particularly effective in guiding the designers. A concern with the design from the early stages was to keep the focus sufficiently on the budget constraints and this required continuous vigilance by the Project Manager and the Bank. It resulted in a major reassessment at final design stage necessitating re-design to reduce costs without compromising quality with changes notably to the roof structure, the scope and materials specifications.

#### ► **The construction**

The construction was split into two blocks of contracts. The preliminary and temporary access works (M1) and the excavations (M2) were separated in time from the main construction contract. This allowed an earlier start on the site, before the final design was completed, and also separated these potential risk items from the main contract.

The two advance contracts were carried out expeditiously without undue difficulty. The excavation in the Luxembourg sandstone revealed sound foundations, with excellent quality rock abstracted which was subsequently re-used thus reducing costs and environmental impacts. During the construction, access for the staff's cars was provided temporarily from the lower end of the existing tunnel directly onto the Boulevard Konrad Adenauer, a very neat solution.

Following on from the two preliminary construction contracts, the main contract (M3) grouped



A distinctive feature of the new building is the incorporation of atria between the wings – one is seen here being fitted out in January 2008.

together all the other activities required for the construction and fitting out of the building.

The main contract was awarded to a joint venture of Vinci Construction Grands Projets (France) and CFE (Belgium). The wide scope ranged from the responsibility as a General Contractor for coordination, the main structure including design, the façade / roof construction including steel structure, the mechanical, electrical & plumbing services including design, the lifts and good lifts, as well as the finishing and exterior works.

As previously explained the design role varied depending on the component and this was explicit in the tender and contract. The idea was to allow the Contractor scope to optimise the details of the

concrete design to suit his construction methods but based on the concepts established by the Design Team and to be to the latter's satisfaction. The more specialised façade and roof design was to be, to a large extent, fully completed by the Design Team with the workshop details only to be provided by the Contractor. The services were to be designed in detail by the Contractor to criteria defined by the Design Team. In every case the Contractor was required to check and be satisfied of the correctness of the design. The design responsibility issue became a source of disagreement between the parties.

The award was agreed upon in January 2005 with work already starting then and the contract



was formally signed in March 2005. Completion date was set for June 2007 and eight intermediate progress milestones were agreed.

From the early stages mobilisation was slow and a critical concern became the progress of the structural concrete design. In mid-2006 the Contractor brought in a more experienced design team with a clear improvement. The final completion date was set for March 2008.

Two interesting sets of data illustrate the international nature and complexity of the construction work.

In the Main Construction Contract (M3) some 100 enterprises participated under the French-Belgian joint venture. Firms from at least nine different European Union countries participated actively in the construction.

The total work input required for the on-site construction is estimated at 10,000 man-months, providing significant local benefits in temporary employment.

#### ► **The internal arrangements**

For the users, a crucial and very visible part of any office is the furnishing and fittings, and these are of more relevance to them than for example the structure, however innovative. Carpets, lighting and furniture all required special attention to ensure high modern standards and compatibility with the design concept and the Design Team was closely involved in these choices, as were the Bank's staff and their representatives. A full-scale mock-up of the offices was prepared at an early stage allowing optimisation. The idea as always was to contain costs by using standard products as much as possible, provided the quality and specification were appropriate.

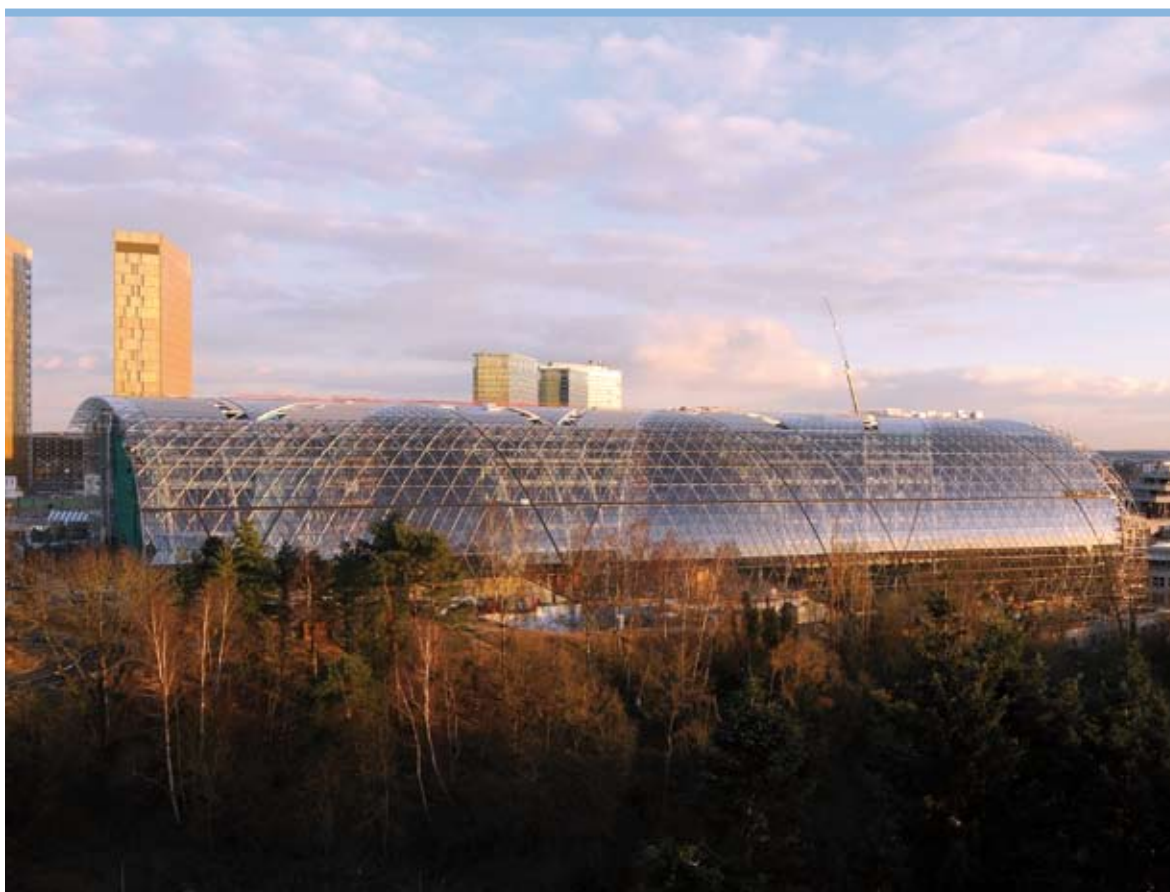
The integrated design of the new building gave an opportunity to commission new art works in line with the long standing policy of the Bank to encourage contemporary artists from inside the European Union and Accession Countries. The Arts Committee was set up in 1994 to ensure a rational approach to new art purchases with the objective of building up a permanent collection of significant works of contemporary art since the Bank's creation in 1958 by the Treaty of Rome. The committee, chaired by a member of the Management Committee and with senior and representative membership, coordinates these purchases advised by several European experts on modern art. Three major works have been specially commissioned, following an international competition, to be integrated into the public areas. These imaginative works comprise two long wall paintings set in the restaurant and the cafeteria respectively and a floor design in the main atrium. Other works of art will also be purchased or re-located to enhance the New Building.

#### ► **The outcome and conclusion**

The East Building has now been completed and the result is clear for all to see and appreciate. It is a striking and innovative design and provides an interesting dynamic contrast to the Lasdun-designed buildings and other adjacent buildings. It illustrates the developing nature of the Bank by its modern high technological and transparent exterior, which is matched by an efficient and imaginative interior to high standards. By their design and construction these offices may be deemed fit for the 21st century and beyond.

This rather complex building will need careful





Rear view of the building seen from the north and overlooking the Val des Bons Malades.

and expert management in operation to ensure its optimum use in economic, energy and comfort terms and the Bank is aware of this challenge.

The process of achieving this result has not been easy and has been covered in some detail in this article. The Bank has had to live the realities of project development in the same way that many of the Bank's clients have had to do. The fact that the end result has been so satisfactory is due to the persistence of many and is to their credit. The Bank has tried to act in an open and practical manner with close consultation throughout the process with all active parties, but in particularly in consul-

tation with the staff, the ultimate users and beneficiaries of the building.

The building has been conceived from the start to be a model project in its implementation, and with the highest standards and concern for the environment and efficiency for the long-term benefit of the Bank to ensure its future through the well being of its greatest asset, its personnel.

Time will tell if this objective has been fully achieved but it augurs well.

*Peter Bond is the Adviser to the EIB's New Building Task Force.*