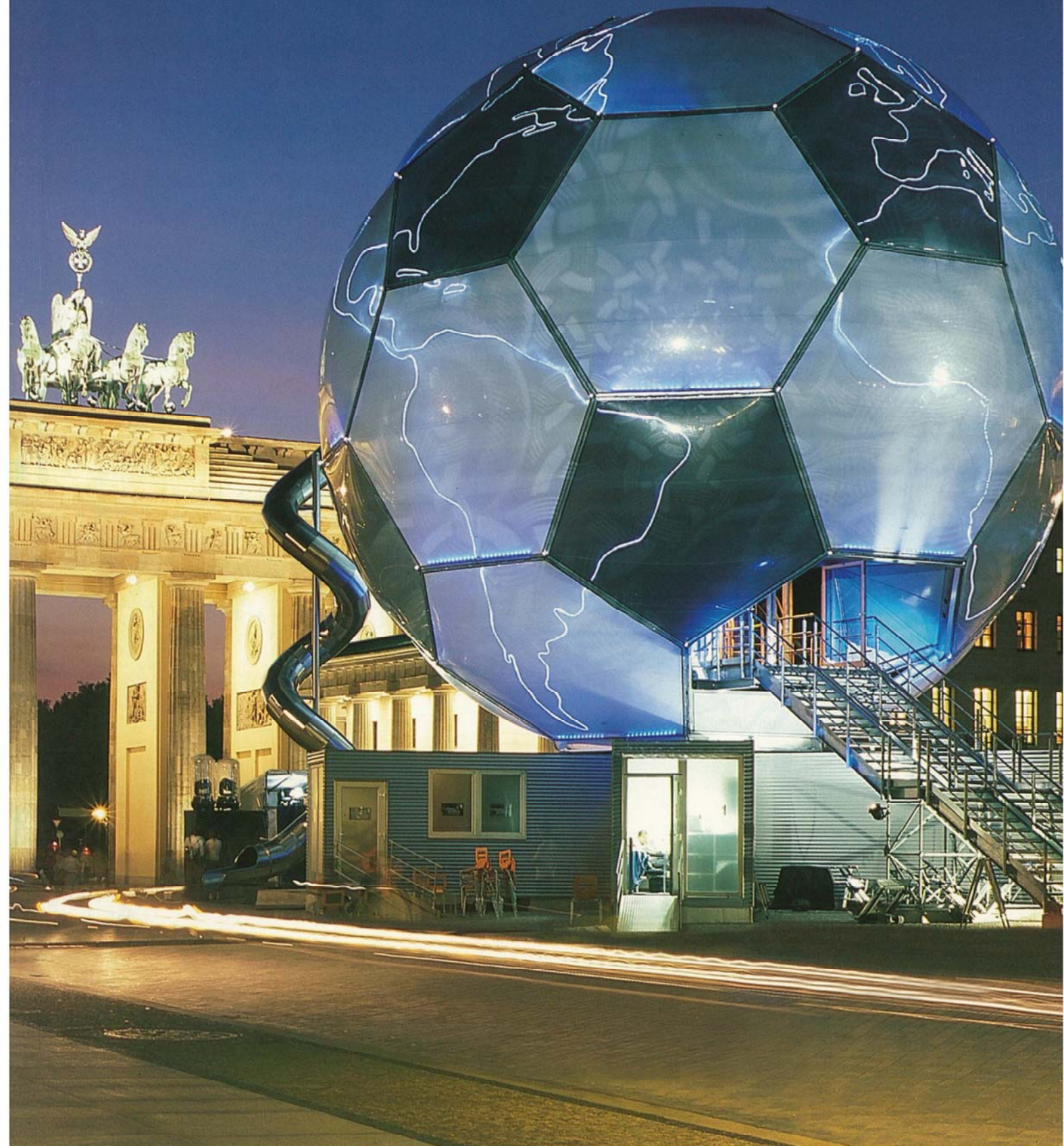


# Vision

MERO 

*MERO-VISION, Number 39, 2003/2004*



# Spectacular Projects during the Anniversary Year of Max Mengerlinghausen

The year 2003 was guided by the memory of Dr.-Ing. Max Mengerlinghausen, who would have celebrated his 100<sup>th</sup> birthday in October 2003. In a festive symposium at the internationally renowned Bauhaus in Dessau well-known speakers gave insight into the achievements of Mengerlinghausen as well as perspectives for the future of MERO (pg. 3).

In the business year 2003 we continued the reformation of the four divisions of MERO: MERO International (Construction Systems), MERO Floor Systems, MERO Exhibit Systems and MERO Airport-Technik as independent profit centers.

MERO International, under a broadened management team, has been able to complete a number of impressive projects such as the Scottish Parliament in Edinburgh, the Bur Juman project in Dubai, the main Railway Station Lehrter Bahnhof as well as the German Historical Museum in Berlin and shows a solid order backlog for the year 2004 that will guarantee a good capacity absorption.

An important milestone was the award of the contract for the New Milano Fair designed by architect Massimiliano Fuksas. With an imposing entrance hall and a 1.3 kilometer long glass walkway, this is an ideal project for MERO's construction methods and shows the direction in the use of MERO's technologies for the future in solving demanding geometric tasks. With a contract value of € 55.8 million, the New Milano Fair is one of the largest projects in company history.

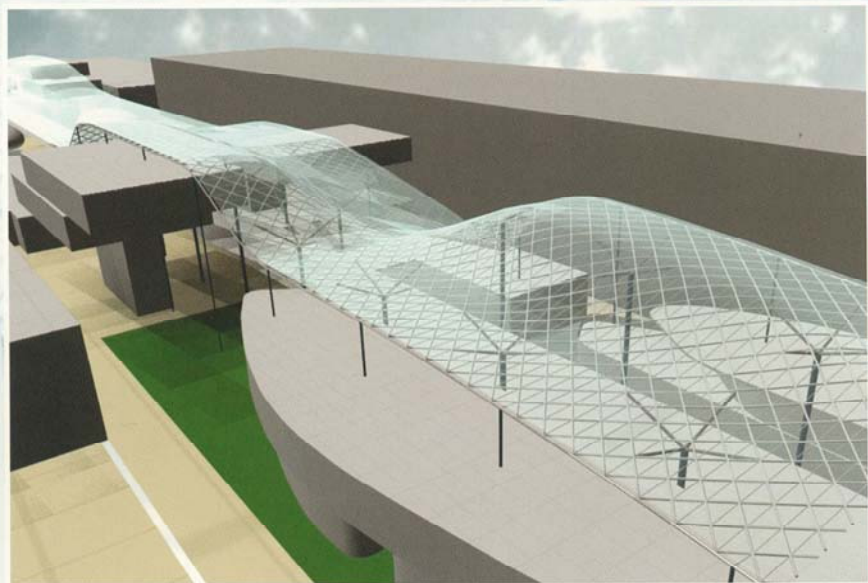
A highly publicized event is the MERO solution for the Soccer World Cup 2006 (cover) - a "soccer globe" with a diameter of 15 meters and a total height of 18 meters which is covered with ETFE-cushions. The project was initiated by the Austrian

artist André Heller with his company Artevent for the German Soccer Association. The oversized soccer ball promoting this event will move through the twelve championship locations till the Final 2006 in Berlin.

MERO Floor Systems has finalized their cost reduction and restructuring program to adapt to the changed market conditions on a national and international level. Amongst others the sales subsidiaries in Belgium and the Netherlands have merged to create MERO Benelux. These



*Brandenburg Gate, Berlin - the first location of the oversized soccer ball*



measures have heightened the competitiveness of this division.

The Exhibit Systems Division focused strongly on innovation and received the IF-Design Award for the development of the exhibit system ARCUS used for the construction of single-layer biomorphic structures. Of particular note, the R8 Plus product family was completed and first sales successes have been achieved. For 2004 we expect an increase in trade fair budgets and therefore an expansion of business activities in this market.

*Lattice grid solution for the New Milano Fair Arch.: Massimiliano Fuksas, Rome*

The Airport-Technik Division completed the modularization of their product range and has been able to successfully complete projects in the Middle East as well as obtaining new orders that will lead to an increase in business volume.

In total we have positive expectations for the upcoming year and have an order backlog that suggests an achievement of our goals for 2004.

Dr. Roland Klose  
Managing Director

Josef Rossmannith  
Managing Director



## 100 Years Dr.-Ing. Dr. E.h. Max Mengerlinghausen Pioneer of Elementized Building Construction

*„Mengerlinghausen’s legacy  
is not only a way of building,  
but a way of thinking.“*

*Citation: Dr. Eugen Kurrer*

Mengerlinghausen is considered the inventor of building constructions with space frame structures consisting of nodes and beams with a bolt as their only connection – in short, the MERO Construction System. This system allows the construction of wide-span lightweight space frame structures for roofs and facades. It is especially suited for the economical realization of curved roofs. Today, the name MERO (originally MEngeringhausen ROhrbauweise) has become synonymous with space frame systems as such.

After studying mechanical engineering in Berlin and Munich, Mengerlinghausen opened his own consulting office in Berlin. This brought him into contact with architect and Bauhaus founder Walter Gropius, and the idea of building with standardized elements, which became the nucleus of Mengerlinghausen’s life-work, the development of the MERO Construction System for space frame constructions on a large scale, was born.

The lectures held in the auditorium of the Bauhaus presented milestones of MERO history, from the “invention” of the space frame structure (Dr. Eugen Kurrer) to the construction of biomorphic structures (Prof. Werner Nachtigall) which follow principles manifested in nature. Only by using the latest in software has the design and execution of this type of construction become feasible. But on another level, the lectures also staked out a map of Mengerlinghausen’s genius and honored his constant striving to anchor his technical achievements in the larger sphere of natural philosophy. To transfer the idea of standardized elements from the space frame structure to building envelopes as a

whole, to roofs and facades, is a logical step if one follows Mengerlinghausen’s work. It is also an inevitable step in the face of constantly more complex architectural designs which must be reconciled to rigid economical thinking. These new trends in architecture were illustrated by architects Prof. Volkwin Marg and Thomas Pink and consultant Prof. Werner Sobek. MERO continues to bring them to reality in a number of innovative materials (glass, membranes, foils, titanium sheets etc.) to fulfill architectural dreams and visions.



*Dr. Roland Klose thanks Prof. Omar Akbar,  
Director Bauhaus Dessau*

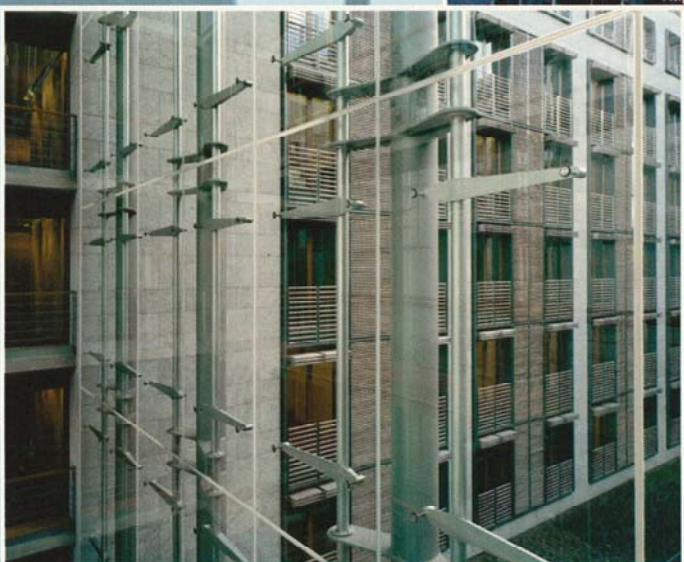
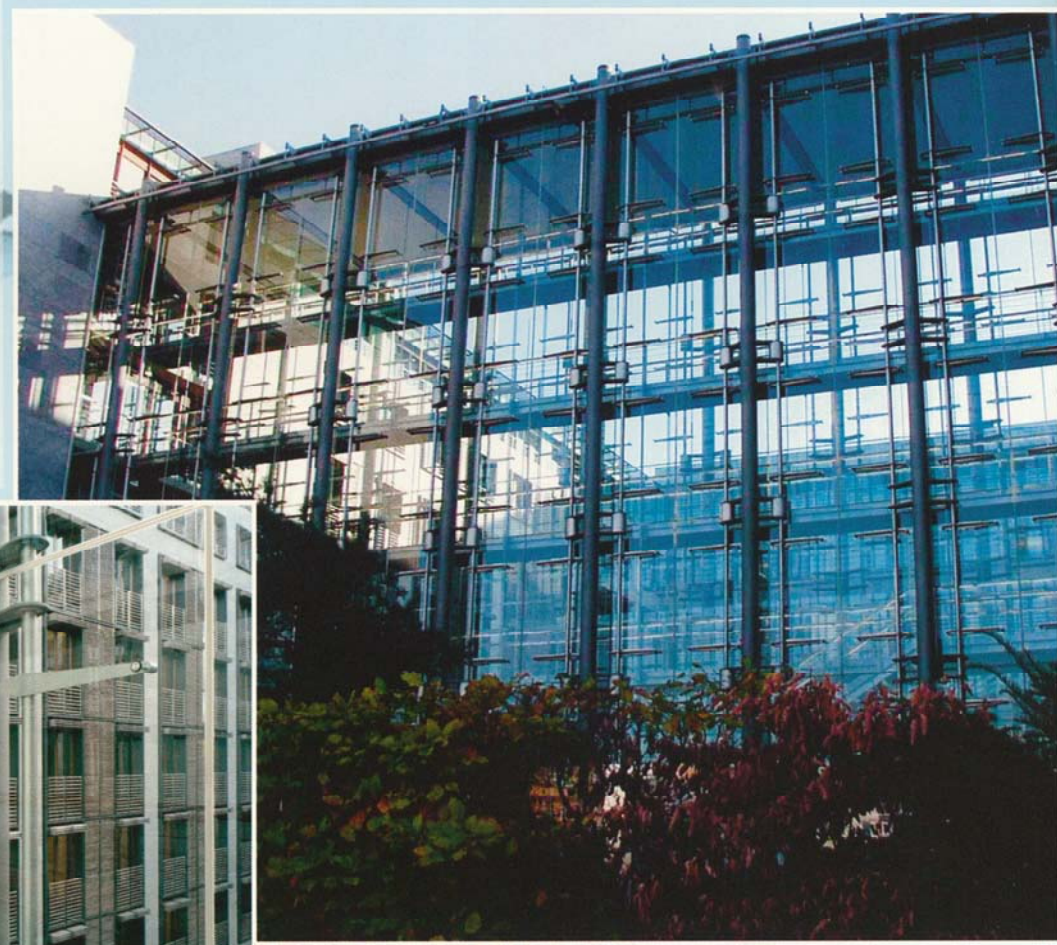
**Openness and transparency**  
**The Jakob-Kaiser-House, Berlin -**  
**a new building for the German**  
**Bundestag**

The largest new building project of the German Bundestag in Berlin is the Jakob-Kaiser-House where the parliamentary parties and the members of the German Parliament have their offices. This building complex is situated in the immediate vicinity of the Reichstag building. Together with the Northern courtyard, the glazed hall in East-West direction melts the building complex into the urban context of the river Spree and the Spreepromenade street. Thanks to the high transparency of the structure the promenade is optically lengthened deep into the block structure and the boundaries between courtyard area and exterior seem almost obliterated. The glazing is point supported on horizontal stainless steel fins which are welded to the steel sections of the columns. The single layer 1.8 x 3.5 m safety glass panels have a hydraulic opening mechanism.

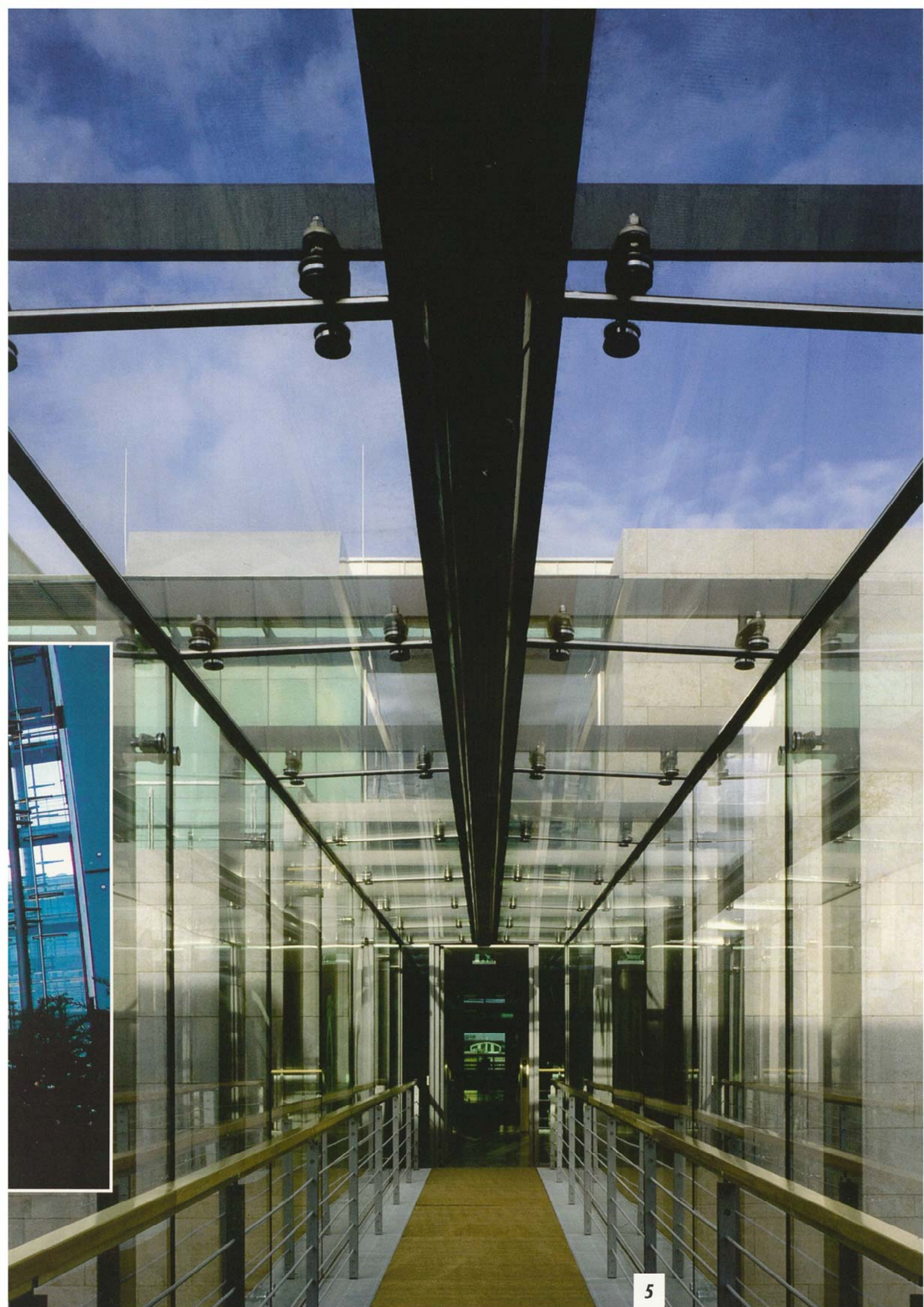
**The bridge – a door to the city**

The pedestrian bridge across the Dorotheenstrasse is a framework structure supported on two steel rollers with filigree bracings and a point supported cladding of insulated glass.

Arch.: gmp Architects, Hamburg (Germany)



Pictures by  
 Arwed Messmer  
 Roland Halbe



**Like a precious piece of jewelry fashioned from steel and glass, the new extension of the German Historical Museum rises between the Arsenal, the Neue Wache Central Memorial and the Maxim-Gorki-Theater.**

As an architecturally independent element, the staircase tower was positioned in front of the great glazed hall with its three facade and two roof levels. For the great hall, insulated glass with a high light transmitting capacity and low heat transition coefficient ensures the highest possible transparency together with optimal thermal insulation.

Parts of the facade glazing are shatter-resistant as a safety measure for visitors; the roof glazing can be walked upon by maintenance and cleaning personnel.

The facade of the staircase tower varies from level to level. On the ground floor it is shaped like a truncated cone with its vertical axis inclined an additional 10 degrees towards the inside. Each pane in this area has a unique individual shape.

Arch.: I. M. Pei, New York  
Struct. Design: LERA, New York



## ... Powerful Dynamics

**Measuring 62.30 m, the highest tensegrity tower ever built became the symbol of the International Gardening Fair IGA Rostock 2003**

In only ten days, MERO built the new symbol on the exhibition grounds of the IGA, the 62.30 m high so-called „Warnow Tower“.

The term „tensegrity“ refers to structures which consist of a continuous system of tension elements and a discontinuous subsystem of compression elements. The tower consists of stacked triangular prismatic elements in which the intersecting compression bars do not touch each other.

The design by Prof. Volkwin Marg, gmp Hamburg, symbolizes – in his own words – the powerful dynamics of our social interactions. This tower brings a new development in the world of architecture to the old Hanse town.

*Arch.: gmp, Hamburg (Germany)  
Struct. Design: Schlaich Bergermann und Partner, Stuttgart (Germany)*



## **Historical Granaries in Hamburg are filled with new life**

This redevelopment project in the heart of the old warehouse district is a successful attempt at renovating and transforming old administration buildings and warehouses into a unified office complex around a central atrium.

The atrium was created by erecting a barrel vaulted single layer space frame with cable bracings over the inner courtyard. In order to absorb the forces arising from this structure, a steel structure invisible from the outside was integrated into the existing framework of the roofs, clad with fire-resistant Promat.

The roof itself has an irregular plan shape of approx. 13 x 15.5 m and a slope of approx. 0.5 degrees due to the geometry at the zenith. At one end wall, the structure is additionally supported on two columns and connected by a beam tie and at the other end wall it is stabilized by a fan-shaped system of cable bracings.

The cladding consists of insulated glass, each pane with a unique shape of its own.

Twelve different smoke vent openings in the roof provide the necessary ventilation.

The roof is cleaned and maintained from an internal, conically shaped maintenance system.

*Arch.: gmp, Hamburg (Germany)  
Struct. Design: Schlaich Bergemann und Partner, Stuttgart (Germany)*





# ... „Flying Carpet“

## **Canopy over Memorial at Nigde, Turkey**

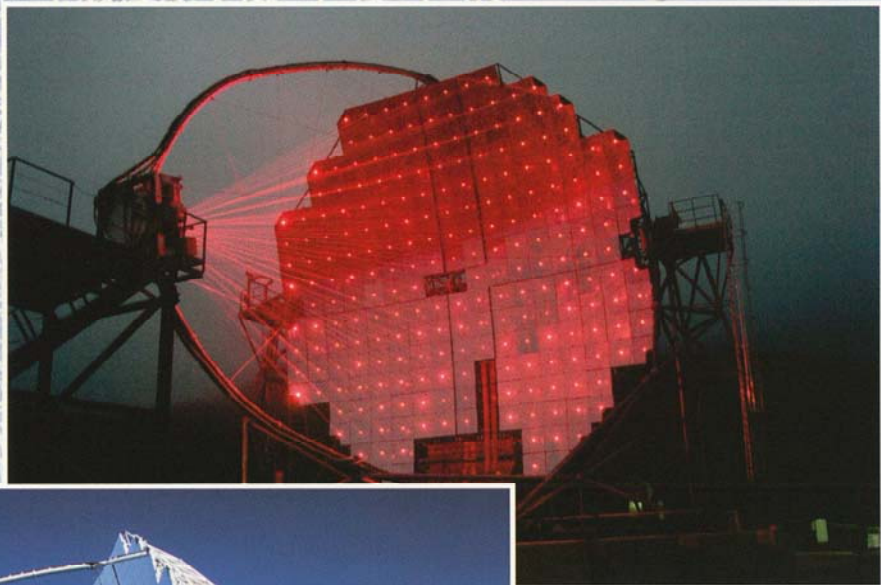
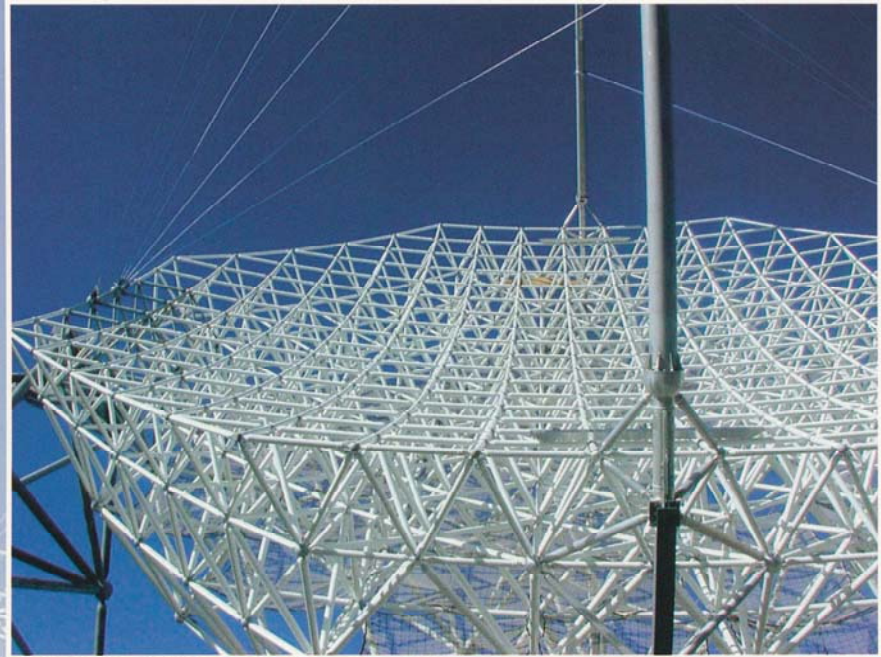
A canopy in the shape of a „flying carpet“ is the salient feature of a memorial at Nigde, Turkey. The roof area consists of a single layer wavy shell structure spanning between two edge supports. The troughs of these waves are executed with heatable glass panes in order to assure an unimpeded view even during snowfalls.

*Arch.: GKV Architects, USA*

# ... Giant Telescope of MERO Carbon Fiber Space Frame

## A view into Deep Space

On the Canary Island of La Palma, scientists from the University of Wuerzburg (Germany) have erected a new type of telescope for the study of space. With a diameter of 17 m, this telescope is the greatest of its kind in the world. It consists of 1,000 diamond cut aluminum refractor facets, each sized 50 x 50 cm. Four refractor facets are on each selectively controllable panel. The ultra-light space frame structure of MERO ball nodes and beams made of carbon fiber material supports the refractor. Scientists hope that the telescope will give them an opportunity to study the gamma radiation originating from exotic objects like supernovae or black holes. Besides the University of Wuerzburg two other German institutions – the University of Siegen and the Max-Planck-Institute for Physics in Munich have cooperated on this prestigious project.



# ... MERO Austria GmbH, Austria



## **STRABAG Headquarters, Vienna** **Glazed facade as** **elementized construction**

The building is approx. 64 m high and has twelve floors above and four floors under ground. The mullion construction of the facade has a total surface of 2,300 m<sup>2</sup>.

Arch.: Prof. Dipl.-Ing. Ernst Hoffmann, Vienna



## **EURO PLAZA, Vienna**

MERO Austria GmbH supplied and installed the metal facade including glazing for Buildings A and C. Covering a total surface of approx. 10,700 m<sup>2</sup>, the facades are of three different types.

Arch.: Neumann & Partner, Vienna

**A Work of Art for Venice  
Chris Ofili at Biennale 2003**

Based on a design by artist Chris Ofili, architect David Adjaye and consultants Ove Arup, a glass installation was constructed for the British pavilion. This installation consists of 180 mostly triangular panels in red, green and black which form a shingled dome with a diameter of approx. 10 m. Each individual panel is made of two panes with an intermediate layer of foil (laminated safety glass). The colors result from the different coatings on the surface of the panes. Red, green and black are combined in the flag of the future United States of Africa, colors which are also echoed in the paintings of Chris Ofili.

The panels are suspended from a MERO space frame structure with suspension rods at their respective centers of gravity. The constructive principle of the structure results from the positions of these centers of gravity, since the nodes of the space frame are positioned over them.

The glass panels are connected to the suspension using steel profiles which are glued to the glass panels (visible through the transparent panels as black strips), with one steel corner plate each, to which the suspension rods are fixed with two bolts.





**Shopping Center  
Villanuova sul Clisi**

Daylight falling through the transparent cladding makes shopping a pleasure in the shopping center Villanuova-sul Clisi near Brescia (Northern Italy). MERO Italiana supplied the steel structure of spherical nodes and beams for the conical roof, gallery and glazed facade as well as the entire glazing and installation work of the approx. 2,787 m<sup>2</sup> total surface. A short construction period enabled the shopping center to open to the public in spring 2003.

Arch.: *Studio Rodighiero Associati, Italy*





**First National Center - Wintergarden  
Omaha, Nebraska**

MERO USA furnished and installed 1,889 m<sup>2</sup> of a design-build steel support structure for the sloped walls and the roof of the wintergarden.

Arch.: Leo A. Daly, USA

# MERO Structures, Inc., USA

## **Maverick Tower Dallas/Fort Worth International Airport, Texas**

Circular steel space frame with a diameter of 61 m to support expanding metal and walkway grating. Total surface area 2,824 m<sup>2</sup>.

Arch.: Freese & Nicholas, USA



## **First & Howard San Francisco, California**

This project represents the first double wall glass building constructed in the United States. The exterior envelope consists of mullionless structural glass. The glazing is low iron to ensure ultimate transparency. To enhance this effect, the support system was made up of an intricately engineered, lightweight stainless steel tensile structure.

L-shaped glass wall, each leg approx. 22.4 m with a 1.98 m angled return. The wall is approx. 28.8 m high, the total surface area is approx. 1,292 m<sup>2</sup>.

Arch.: Studios Architecture, USA



China Square, Singapore  
Arch.: ADDP Architects  
Pte. Ltd., Singapore

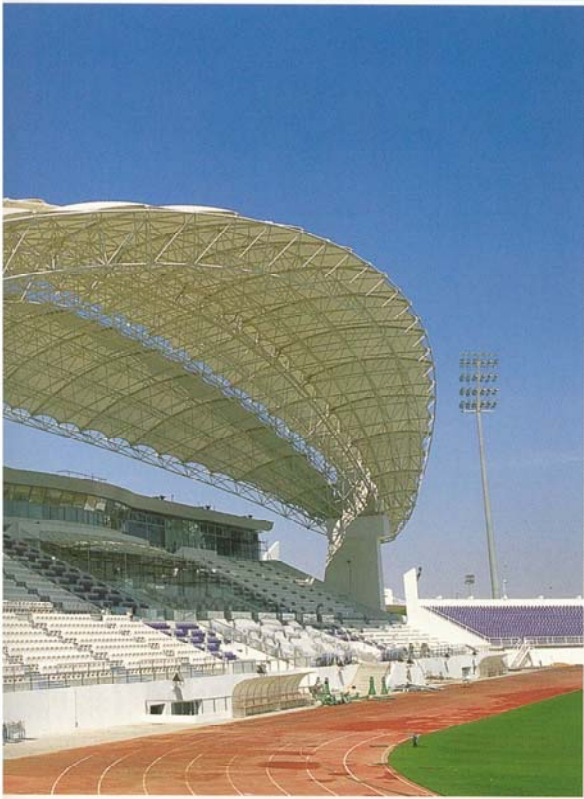


MERCATO, Dubai  
Transemirates Contracting,  
Dubai

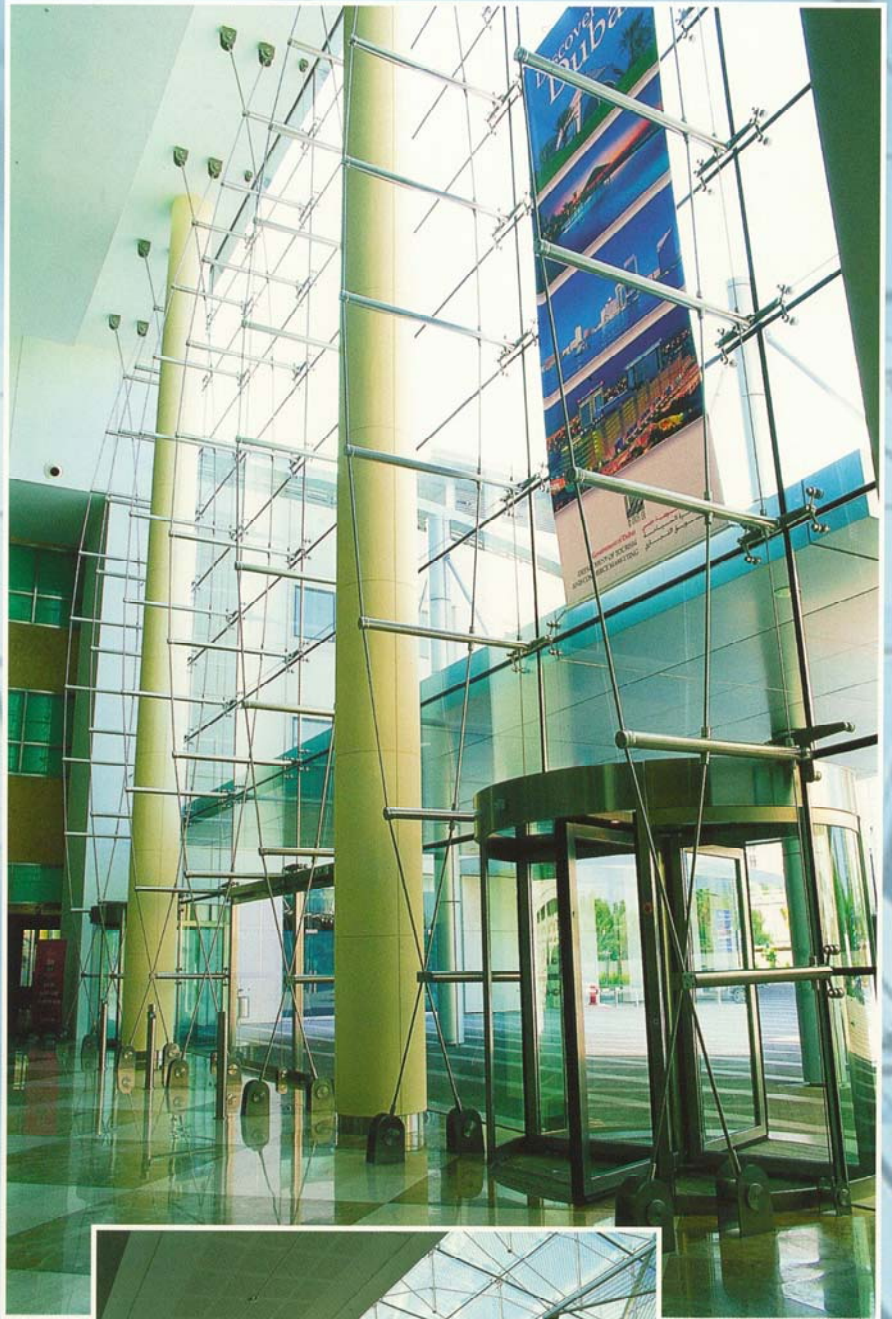




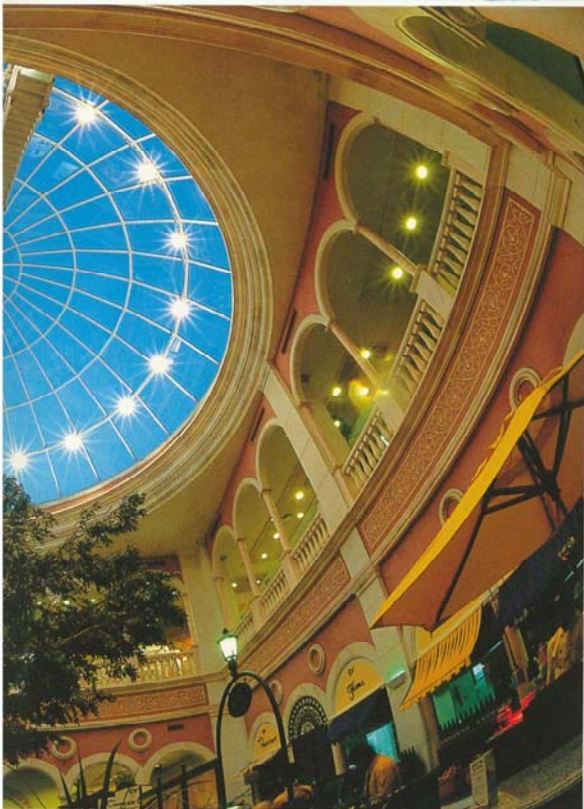
# MERO (Middle East) LLC, Dubai



VIP Grandstand  
Al Ain Stadium, Al Ain (UAE)  
Arch.: Rice Perry Ellis, Dubai



Dubai Convention Center, Dubai  
Arch.: RMJM Architects, Dubai



MERCATO, Dubai  
Transemirates Contracting,  
Dubai

**MERO Access Floor meets the highest standards in all fields of application for top level data processing.**

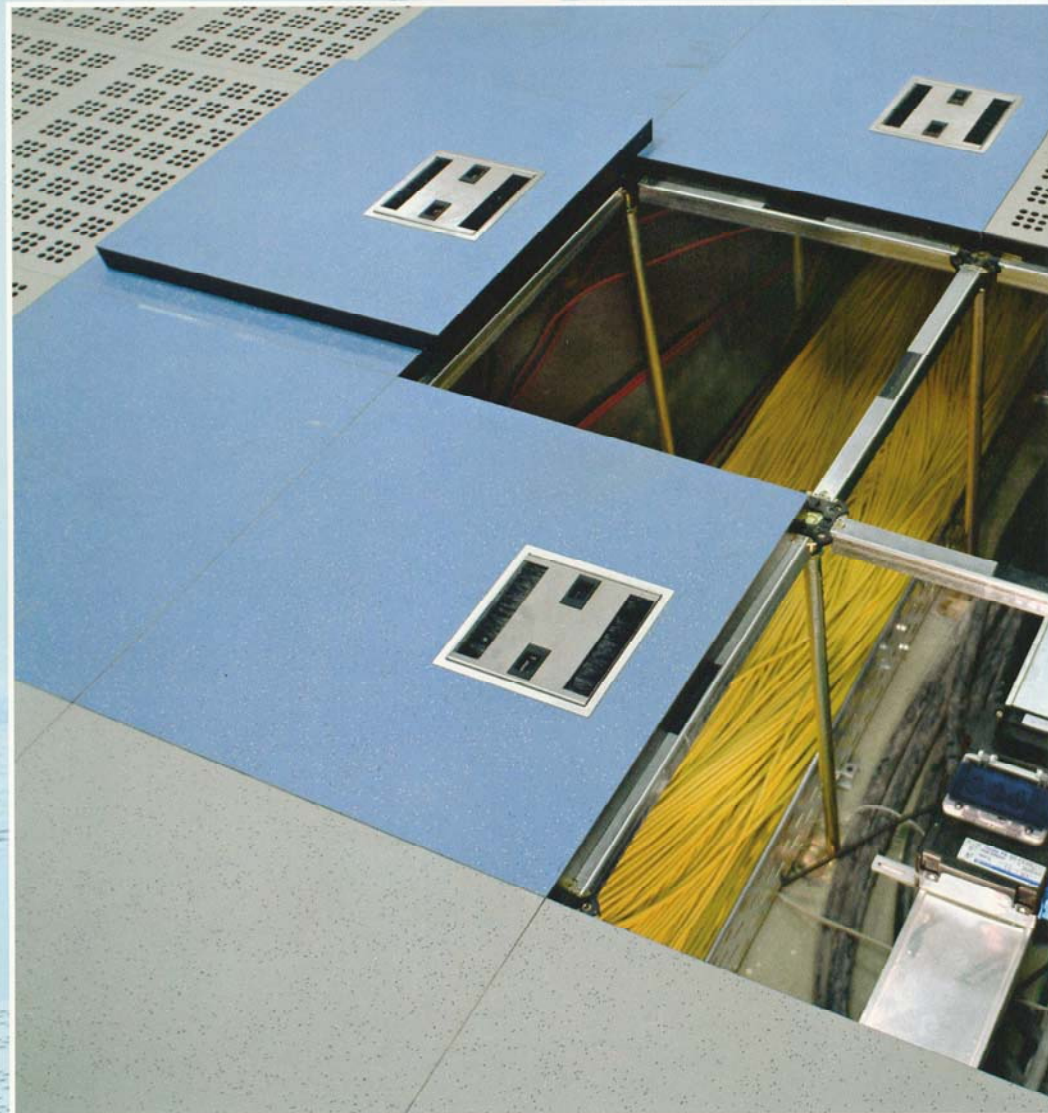
Intense discussions with consultants and client during the planning stage made it possible to meet and realize the requirements of SAP.

14,200 m<sup>2</sup> of MERO access floor type 6NB with screwed stringers and dowelled pedestals were installed. Despite the total floor height of 80 cm, bridgings of fire protective materials with a length of up to two meters were utilized. For the temperature control of the computer rooms and computers, the access floor was installed as air plenum. This means that air flows into the rooms through 7,900 steel ventilation panels, equipped with gradual air flow control. To obtain maximum efficiency in placing the computers, approx. 50% of the ventilation panels used were manufactured in special sizes.

The access floor in corridors and computer rooms, approx. 11,500 m<sup>2</sup>, was provided with factory-applied conductive rubber to minimize static.

More than 500 m<sup>2</sup> of switch cabinet frames ensure the stability of the switch cabinets.

*Planning and Management of Works:  
Architects Vorfelder, Walldorf (Germany)*



# ... Data Processing on the Highest Level



*Cool air flows into the rooms through ventilation panels with gradual air flow control*

**Starting from a strikingly curved free shape structure to the completion of the „squaring of the circle“; this year, MERO Exhibit Systems has intensively occupied itself with the realization of unique geometries.**

The development of the system ARCUS for single-layer biomorphic structures was awarded with the popular IF Design Award. The M12 tube node system has entered a new dimension where novel designs are possible. MERO's sales partners have realized this opportunity and have been using the ARCUS construction system to create fantastic new worlds in the exhibit industry.



*Designtage Coburg, Germany*

By presenting the „squaring of the circle“ MERO Exhibit Systems introduced a simple but ingenious idea for the extension of the R8 System program.

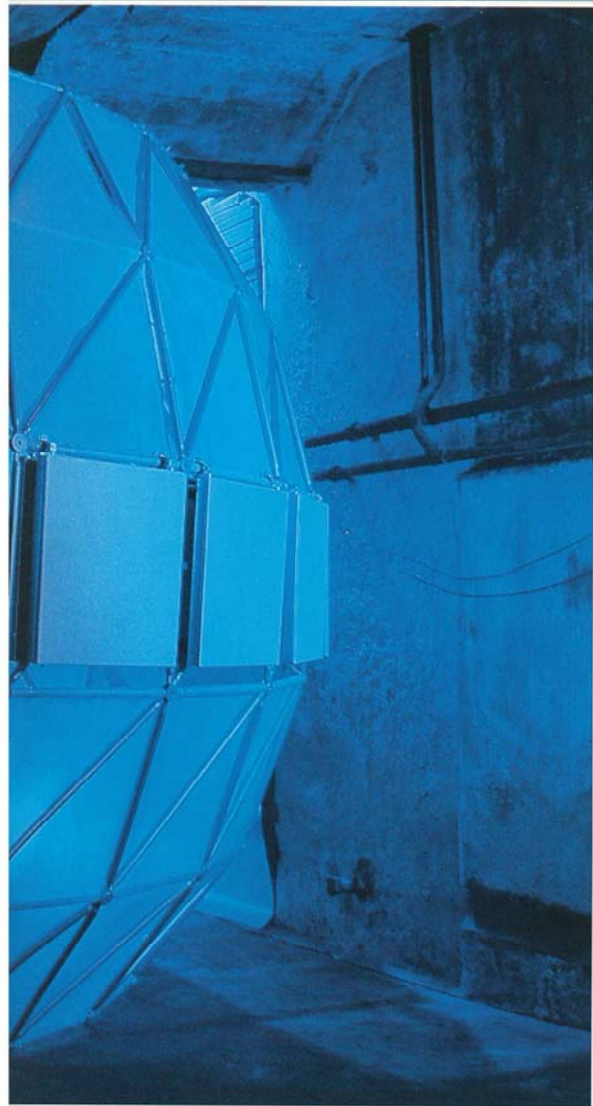
The three new profile sections (round, oval, square) with enlarged diameter from R8 Plus, realize modern design demands such as large-format cubic structures. Since the interior core of the new profiles is identical with the standard R8 System, system axial dimensions as well as cutting and deduction measurements remain the same. This makes R8 Plus very inviting for

users of comparable aluminum profile systems, since extant stock material can be updated with R8 Plus supporting profiles.

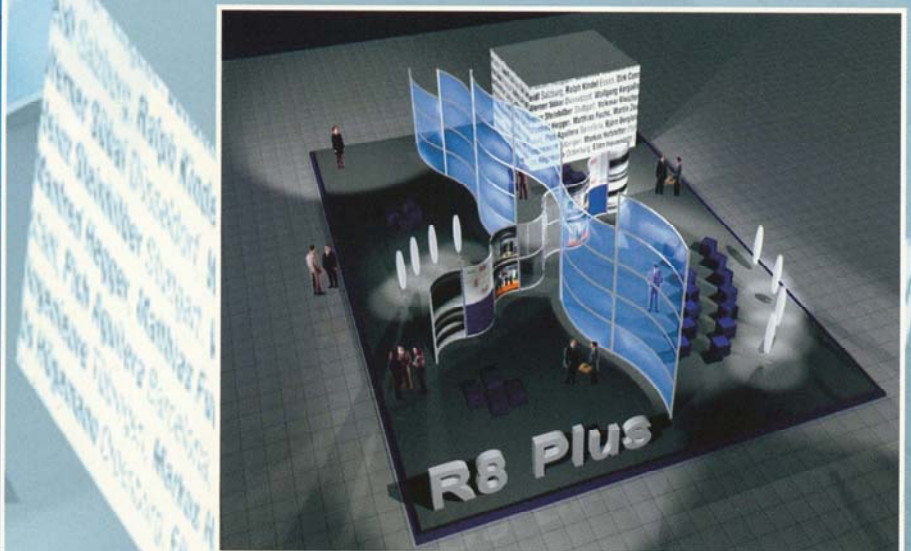
# R8

# S

# ... Playing with Shapes and Contrast



Trade fair stand Switch, Italy



Design studies with R8 Plus:  
Loth & Partner, Duesseldorf (Germany)



**MERO Airport-Technik sets on Growth with a Mixture of Innovation and the Approved**

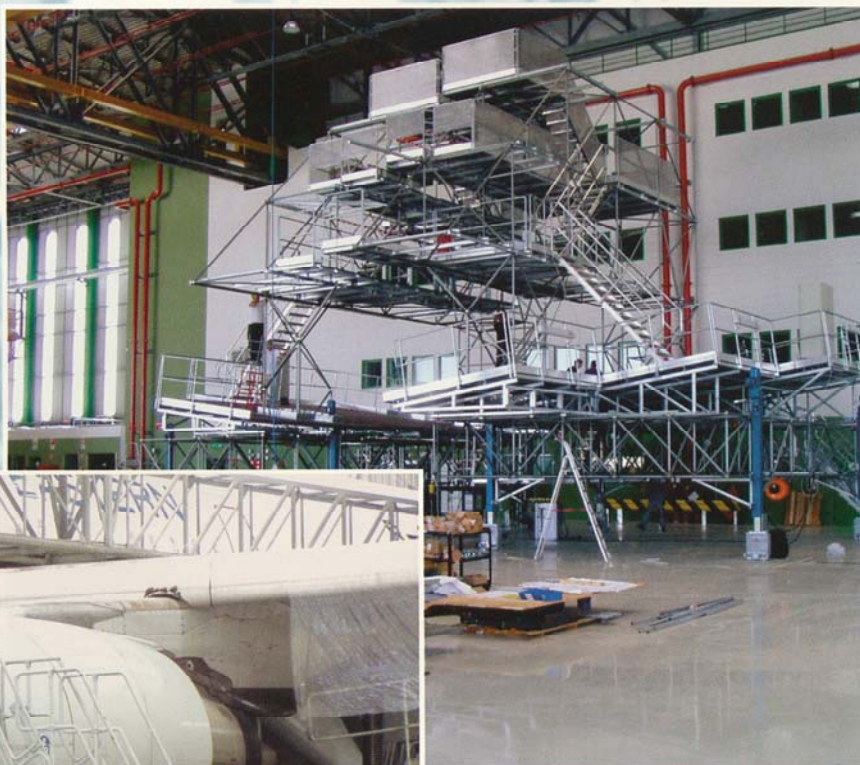
Once again MERO Airport-Technik accommodates their customers with innovative product ideas in aircraft maintenance. The combination of multi-use, coordinated components that reach far beyond the well-known MERO docking system program, enables our clients to increase efficiency and, at the same time, save on their investment.

The MERO MOVE, a universal transportation unit, sets an example. Not only does it allow simplified docking procedures, but at the same time it can be used in conjunction with other equipment required for aircraft maintenance such as lifting platforms, engine replacement etc.

Ongoing solutions using proven MERO space frame building methods are still being sought after. The adaptability and ease of our rigid building method are often the

out-standing characteristics which spark our customers' appreciation. This is why AIR Algerie and Atitech with their recently launched ultra-modern maintenance centers repeatedly turn back to MERO docking systems. Good experiences are the best decision makers.

In addition, the success of the aluminum dock modules supplied to EADS in Manching, Germany, is an encouragement for further developing this building method for comparable applications. Easy handling combined with a high degree of integration possibilities for required installations and equipment are the selling points for constructions of this kind.



*Nose- and tail dock module for A 320 aircraft in proven construction method for new maintenance hangar in Naples*

*Engine dock modules for overhaul, painting works in application on Airbus Widebody fleet at Sogerma, Bordeaux*

# ... Multiple Solutions

*MERO aluminum building method - application at final assembly on Eurofighter in Manching (Germany)*



*MERO MOVE application at lifting platform*





Divisions:

**MERO International  
Construction Systems**

- Space Frames
- Glazed Structures
- Membrane Structures

**Floor Systems**

- Access Floors
- Hollow Floors
- Floor Coverings
- Services

**Exhibit Systems**

- Meroform  
Modular Construction Systems
- Merolite  
Display Systems

**Airport-Technik**

- Aircraft Maintenance Docks

Imprint:

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Cover:

Oversized soccer ball in front of the Brandenburg Gate in Berlin promotes the Soccer World Cup 2006.

*Design:*

*Multimedia Artist André Heller, Artevent GmbH*

**Farnborough, UK**

The first phase of the redevelopment work of Farnborough airport was completed in 2002. For the cladding of the 34 m high Air Control Tower MERO (UK) PLC in cooperation with London based architects Reid Architecture developed a diamond-shaped aluminum shingle system.

*Arch.: Reid Architecture, UK*

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