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the architecture & interior design international magazine | middle east

SAILING FROM MILAN TO DUBAI

Focus: three pavilions
at EXPO Milano 2015
Kuwait, Brazil and Spain

Italo Rota
Arthur Casas
b720 Arquitectos
Michele De Lucchi
OMA/Rem Koolhaas
Dominique Perrault
AGi Architects

EXPO



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director@compassesworld.com

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Neal Putt

Photographer
Sharif Nazal

Advertising Sales Director
Luca Mällamo

Advertising Sales Agency Italy
Agicom Srl
Viale Caduti in Guerra, 28
00060 Castelnuovo di Porto (RM)
Media & Advertising
Mobile UAE : + 971 567890149
Mobile Italy : + 39 3358225239
Phone Italy + 39 069078285
agicom@agicom.it
Skype: [agicom.advertising](https://www.skype.com/contact/agicom.advertising)

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Publisher
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via Via Francesco Crispi 19-23
80121 Napoli
phone +39 081 2482298
fax +39 081 661014
mobile +39 335 5889237

Gulf Countries Representative
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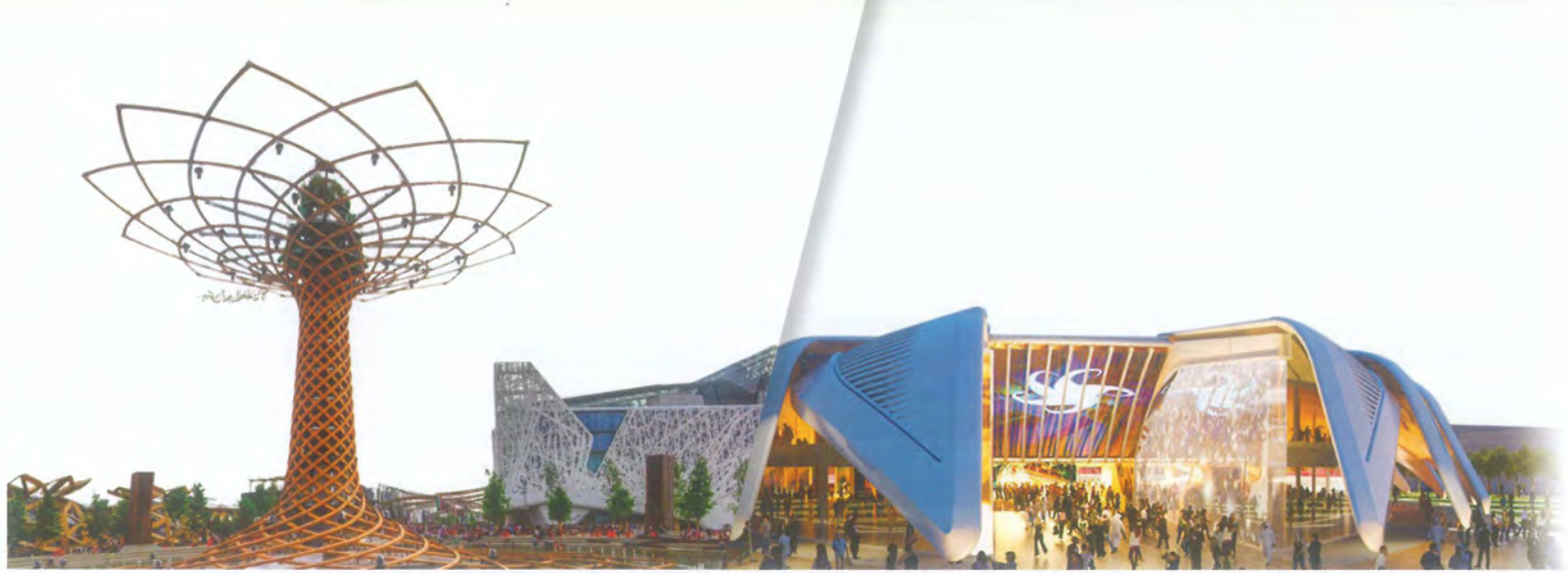
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Top technology for the tallest building: DC Tower in Vienna

Dominique Perrault Architecture

Work

DC Tower 1

Location

Donau-City, Vienna, Austria

Client

WED (Wiener Entwicklungsgesellschaft
für den Donauraum AG)

Project Year

beginning of conceptual design 2002
construction 2010/2014

Architecture and Design

Dominique Perrault Architecture, Paris, France
Associated architect: Hoffmann & Janz Architectes,
Vienna, Austria

Design: Gaëlle Lauriot-Prévost

Project Team

Dominique Perrault Architecture,
Gaëlle Lauriot-Prévost

Engineering

Architectural engineering: Perrault Projets

Structure: Bollinger & Grohmann, Gmeiner Haferl

Zivilingenieure ZT GmbH

Façades: Werner Sobek Ingenieure

Fluids: ZFG – Projekt

Bauphysik: Dr Pfeiler GmbH

Electricity: TB Eipeldauer & Partner GmbH

VRD: AXIS, Ingenieursleistungen ZT GmbH

Wind study: Wacker Ingenieure

Size and total area

site area 11 000 m²

total built area 229 000 m²

built area on surface 155 000 m²

height 250 m (220m + 30m antenna)

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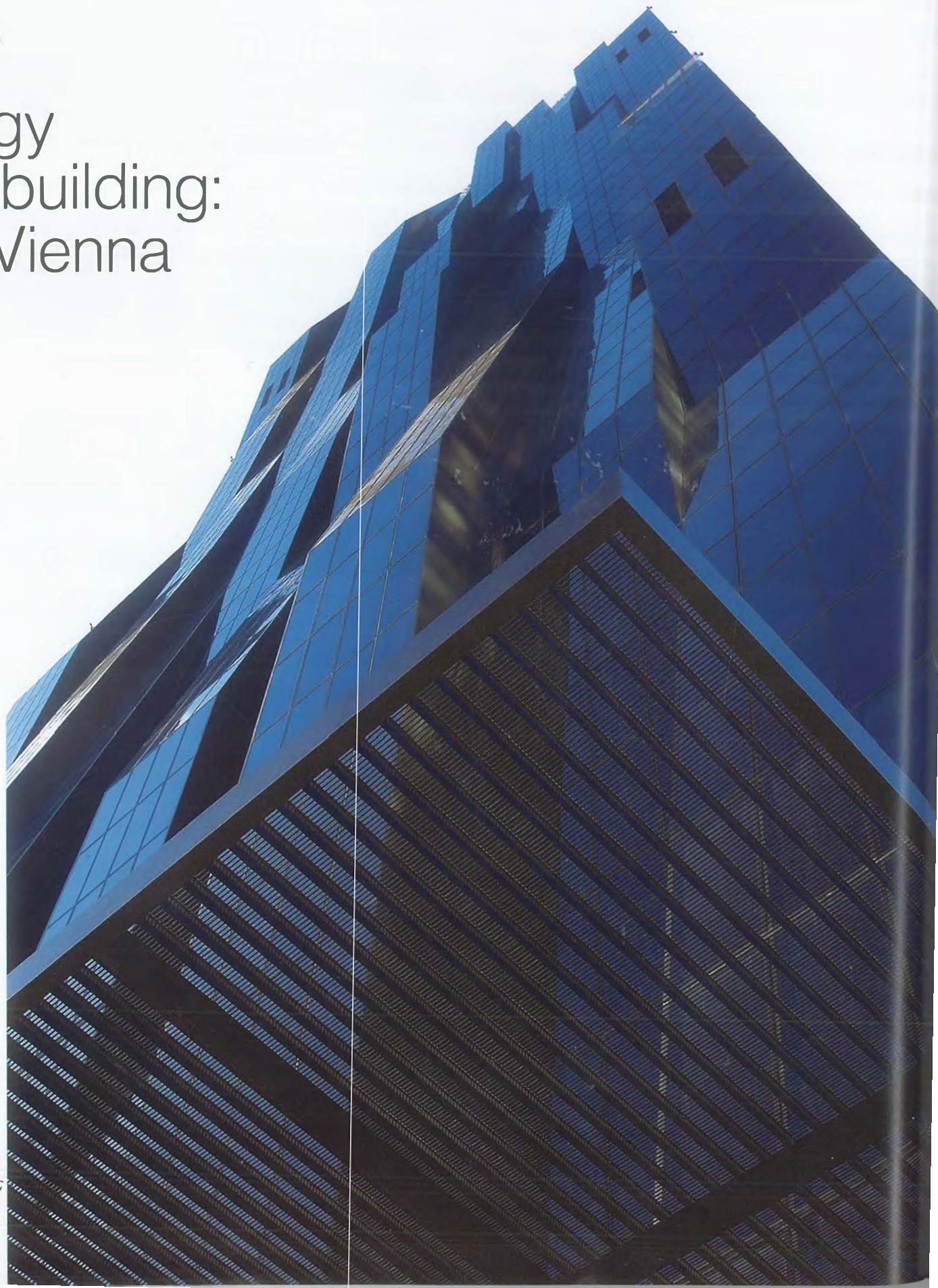
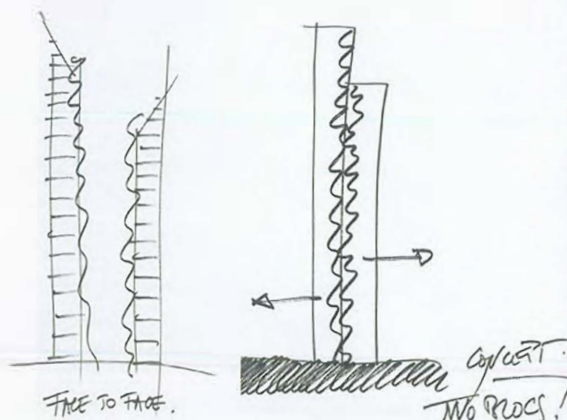
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«With this first tower, the city of Vienna has demonstrated that the controlled, precisely planned emergence of high-rises can participate in creating the city, and in producing contemporary, economical, high energy-performance, mixed-use buildings adapted to metropolitan business requirements and lifestyles». These are the words of Dominique Perrault, as he explains DC Tower 1, part of an ongoing project for the remodeling of the Danube waterfront, in an area where there was once a waste dump.

The French architect was the winner of a competition launched in 1992, for the expansion of Donau City. His idea was a partial confirmation of the master plan program, but extending the base of the complex to the riverbanks in the form of a grand terrace, and substituting the planned volumes with two autonomous but formally complementary towers. The discrepancy between Perrault's overall project and the construction thus far accomplished renders it impossible to fully perceive the structure in context, as well as the evaluation of its response to the economic-management needs or those of the expected urban development. In fact while DC Tower 1 is the first and presently the only one of two planned structures, is also the tallest: impressive and at the same time slim. With its 250 meters of height, it is the highest skyscraper in Vienna, and was among the finalists for the Best Tall Building Europe 2014 prize, as well as taking second place in the Emporis awards as "the best new skyscraper for design and functionality". The international recognition emphasizes how the DC Tower successfully represents a style of conceiving and developing architecture, which in periods of crisis does not cease to put innovative solutions into action, based on density, mixed functionality and energy savings, to respond to the complex demands of the contemporary city.

In his conceptual statement, Perrault declares his intention to make the two towers complementary: «The towers function as two pieces of a gigantic monolith that seems to have split into two unequal halves, which then open to create an arch with undulating and shimmering façades that bring the newly created public space to life in the void created there». The two skyscrapers are also slightly rotated, opening towards the Danube, as an ideal and imposing "modern" gateway, in dialogue with historic Vienna. The city, a venerable grande dame, takes on a new character, assuming a more "international" aspect, not only for the presence of a structure of more contemporary imagery, but also because the intervention represents a new model of urban development, presented as such from the moment it was commissioned.

The multifunctional DC Tower 1 skyscraper contains offices, commercial and restaurant spaces, residences, gyms and parking areas. It is a sort of vertical city, with its own autonomy, where height and transparency suggest a timeless modernity, actualized by the use of top technology and with respect for green building criteria. The sustainability criteria led to the choice of solutions that ensure energy savings and efficiency, in full respect for quality and environmental comfort, in line with what is required under LEED certification. The project thus develops around environmental criteria regarding sustainable sites, water efficiency, energy and atmospheric



criteria, materials and resources, indoor environmental quality, and innovation in design. In substance, this required providing: infrastructure and services that render the site accessible by public transport, bicycle paths, electric fueling stations and ample underground parking; water-saving plumbing and waste systems, and indigenous plantings that respect the natural plant life-cycles without requiring excessive water; low-consumption electrical plants, systems for production of clean energy (such as photovoltaic plants and elevators with energy recovery), remote monitoring of energy consumption; the use of FSC (Forest Stewardship Council certified) wood during construction, as well as the use of material and products that optimize local resources and reduce harmful CO2 submissions from transport to the construction site; use of materials that respect all requirements in matters of air quality, for the interior environments (including VOC tests for the finishing of furnishings). All of these considerations aim at the objective of high performance in matters of well-being and safety.

In this work, Perrault again proposes an architectural skin conceived as a *frontière* as opposed to a *mur*, or as the antithesis of a massive, opaque wall. The *frontière*, the interface between indoor and outdoor, is composed of a set of elements assembled in layers, «*qui vont jouer sur la transparence, les reflets, l'ouverture vers l'intérieur et l'extérieur, à l'image de la maille*». Each layer is assigned a role, at once functional and expressive. In some sections the glass is overlain by a mesh - a metal layer, which with different weaves is present in all the works of the French architect - like a layer of skin that wraps and protects the building. The metal, employed as a precious material, participates in the definition of the curtain walls, which become the scene for the mirroring of forms, but also of a refined technical exploration. The play of jutting volumes and inclined surfaces is present on only one of the facades, here representing the ideal split between the glass monoliths of the two towers, in the form of the zig-zag wall (purely a conceptual issue, still incomprehensible in the absence of the twin tower). The other facades share a common verticality of surfaces, but are distinguished by the presence of metal grids or glass panels with different treatments, appropriately paced to optimize the interior illumination and microclimates, according to their orientation. The fact of collaborating with Werner Sobek's





architectural firm is in itself testimony to the integration of the architectural project and this experimentation, and above all to the attention to the technological-environmental aspects. Sobek, among other roles, is director of the University of Stuttgart Bio-Architecture Institute, a professor at the Illinois Institute of Technology, and a member of the Presidium of the DGNB Sustainable Buildings Council. Sobek's fundamental contribution to the design is the transparent but highly performing skin. The solutions adopted for the various glass facades consist of different high-performance panels, exploiting the advanced technologies of the Saint-Gobain brand. For more than three centuries, the Saint-Gobain company has been a producer of building materials, particularly glass, and today achieves 30% of its turnover from energy-saving and environmental protection products. Around 32,000 square meters of the facades are prepared with Climaplus Cool-Lite solar-control glass, (which has a microscopic metal layer on one side, reflecting the heat of the sun outwards and reducing the uncomfortable reflections caused by direct sunlight) and Parsol gray glass (batch-colored float production, offering very low light transmission). Another 10,000 square meters are executed with Seralit Litex glass, which has a printed treatment. For this project, Eckelt Glas, Saint-Gobain's Austrian partner, carried out the construction of the complex façade systems, which among other characteristics also reduce the risk of bird crashes to a minimum. The aspects of the special zig-zag form and the need to obtain maximum flexibility in the internal spaces directed the structural project, specifically prepared by the architectural firm of Bollinger & Grohmann, Gmeiner Haferl Zivilingenieure ZT GmbH. The structure is composed of bearing elements in reinforced concrete set at 5.6 meter spans, with a distance between the exterior pilasters and the central core of about seven meters. The structural solution for the zig-zag façade is particularly interesting: the jutting floors are supported by tension rods linked to outriggers, and to absorb the lateral forces of the wind, a 305 ton pendulum is placed between the 56th and 60th floors.

The extremely simple form of the skyscraper is linked to technically complex structural methods, which as well as the designers and the specialized technicians, drew on a range of production and construction >

firms, gathering diverse competencies from both the local and international contexts.

The work of Perrault and his closest collaborators was supported by the Hoffman & Janz firm of Vienna, which managed the on-site development of the various phases of work. The complexity of the project is evident in the multiplicity of competencies and roles that participated in the various stages of planning, development and execution. The technologically advanced solutions permit the achievement of the intended performance, and of the objectives set for DC Tower 1. However the same cannot be said for the "unfinished" whole of the project. The form and position of the first tower only makes sense in the presence of DC Tower 2, which is not yet built. This results in a denaturing of the planning concept, which justified the presence and conformation of the two volumes in terms of the relations that they established between each other and with the urban context.

From Rem Koolhaas to Renzo Piano, many architects who address this type of building have adopted different approaches in confronting the issues of density, of mixed functionalities, of environmental and energy-consumption criteria, all of which are particularly delicate in the case of skyscrapers. Perrault has acted in a delicate context, and not without substantial difficulties in the management of the intervention on the part of the commissioning agencies. Certainly, DC Tower 1 appears coherent with Perrault's other works, and perfectly in line with the architectural conception which he expressed on the occasion of the Praemium Imperiale, which he won in 2015: «Architecture, as we have said, and as many agree today, cannot be summed up in the construction of buildings. Architecture has a global dimension that touches all territories, all cultures, all human beings, whoever they are. And architecture must be able to house, to protect everyone in the wealthy economies, but also, and especially, in the poorer economies. And to that end, architects must develop new fields of research. Today, architects are faced with extraordinary questions about protecting the planet, but also about protecting the human kind that lives on this planet. For that, it is not enough to simply practice architecture: we must share the architecture that we practice with as many people as possible» .

Paola Ascione



+250.0 ANTENNA

+220.0 TOP

+202.0 F58 RESTAURANT / PUBLIC TERRACE

+199.5 F56 LOFTS

+185.5 F52 OFFICES

+154.0 F43 TECHNICAL FACILITIES

+142.0 F41 OFFICES

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+56.0 F15 HOTEL

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